Rife and his microscopes

BRIAN BRACEGIRDLE

Introduction

In the 1930 s some newspapers in the USA carried astonishing reports about Royal Raymond Rife. They said that he had invented a wonderful microscope, capable of visualizing filterable virus particles, and they carried reports of his having made an electrical device with which he cured cancer, rapidly and painlessly.

It would be tedious to reprint very much of the kind of thing which was written, but the following verbatim extracts are typical.

San Diego Union, 3 November 1929:
NEW APPARATUSES UNVEIL HIDDEN MICROBE UNIVERSE TO HUMAN EYE

Can you imagine a motion picture film whose hero is tiny enough to use the head of a pin for a ballroom floor and invite all his neighbors to come for a dance? Can you imagine the film showing that tiny hero being formed within the egg, breaking the shell to escape, living the normal span of life and dying at a ripe old age? It takes a bit of imagining, true enough, but it's being done right out on Point Loma. Microbes, bacilli, and the smallest units of the vegetable kingdom are yielding up the secrets of their lives to the moving picture camera.... [R.R. Rife] has photographed Bacillus Tetanus,or the germ of lockjaw, at 13,000 times the original size. This enlargement, he says, gave it a tail that never before has been seen, making it appear similar to a lollipop on a stick. Then he concentrated on the spore, and by building it up to 217,000 times he made it look like a chrysanthemum.

Los Angeles Times, 22 November 1931:
SCIENCE'S LATEST STRIDES IN WAR ON ILLS DISCLOSED.

DEVELOPMENT BY SAN DIEGAN HAILED AS BOON TO MEDICAL RESEARCH.

Scientific discoveries of the greatest magnitude, including a discussion of the world's most powerful microscope recently perfected after 14 years of effort by Dr. Royal R. Rife of San Diego, were described Friday evening to members of the medical profession.... Through the use of Dr. Rife's powerful microscope, said to have a visual power of magnification to 17,000 times, compared with 2000 times of which the ordinary microscope is capable, Dr Kendall said he could see the typhoid bacilli in the filterable or formerly invisible stage. It is probably the first time the minute filterable [virus] organisms ever have been seen.

San Diego Union, 7 May 1938:
CANCER BLOW SEEN AFTER 18-YEAR TOIL BY RIFE
Discovery that disease organisms, including one occurring in dread cancer, can be killed by bombarding them with radio waves tuned to a particular length for each kind of organism, was claimed today by a San Diego scientist, Royal R. Rife, Pt. Loma. He added that he had isolated this cancer organism but is not positive yet that it is the direct cause of the disease.... Organisms from tuberculosis, cancer, sarcoma, the tumor resembling cancer but not so mortal as it; deadly streptococcus infection, typhoid fever, staphylococcus infection and two forms of leprosy were among the many which the scientist reported are killed by the waves.

Even to the present day there is much interest in Rife and what he is said to have done - just tap the word "Rife" into your web search-engine, and be astonished at the result! The majority of the queries on matters microscopical currently received at the Science Museum concern their Rife instrument.

It is not, of course, my purpose in this article to offer any judgement on his cancer cure, although I shall outline something of various reports on his machine and its results. I shall discuss the microscopical results he claimed to have obtained, and I shall discuss his five microscopes, with special reference to the fifth. This I have inspected fully during my work with the microscopy collections of the Science Museum, and so can describe it in detail.

Royal Raymond Rife, 1888–1971

Rife, who usually called himself Roy, was born 16 May 1888, in Elkhorn, Nebraska, USA. It is said that he went to live in San Diego, California in 1906, and later became the chauffeur to wealthy retired Henry Timken, of the Timken roller-bearing and axle company. In 1906, of course, Rife would have been only 18 years old, but that was old enough to get a driver's licence.

Timken had a retirement home in Point Loma, San Diego, and Rife lived in a small apartment over the garage. He used a corner of his flat as a little workshop to tinker at his hobby, microscopes and related optical parts. Timken came to know of this, and, it seems, was sufficiently impressed to send Rife to Germany, where he is said to have worked in both Zeiss and Leitz factories for a few years before WW1. Not all accounts of Rife's life agree as to dates, but as Timken died in 1909 Rife must have gone to Germany by then.

In 1912 he is recorded as marrying Mamie Ah Quin, from a prominent Chinese family in San Diego: she had been born 7 October 1886, and would die 10 August 1957. The Chinese Historical Society in San Diego has records of her family, but nothing on Rife.

It is said that Rife was given an honorary PhD by Heidelberg University in 1913, but I have been unable to confirm this. Usually he was called "Mr" in the earlier years, and in later newspaper reports often "Dr": but this, of course, means nothing. It has also been stated that he held fourteen medals from the US and other governments for work on various mechanisms, but it has not been possible to verify this statement. He seems not to have sold any of his microscopes except the last, but became very wealthy; there is no record of how this came about.

Curing cancer

In the 1920s Rife worked on cancer, and with the aid of a light microscope stated to be more powerful than any other ever made, decided that it was caused by bacteria or particles of bacteria, which could transform one into another, that is, were pleomorphic forms. His instrument used light, and thus could view living organisms. He concluded that there were only ten groups of pathogenic bacteria, individuals in each group being able to assume the shape and identity of others in its group, as well as being able to infect if only a small particle of a bacterium was present: he called this small part of a bacillus a virus [1].

So far as cancer was concerned, he stated that he had isolated a virus specific to carcinomas, and called it Bacillus X, or BX virus. He was able to culture this virus outside the body by exposing it to ionizing rays under reduced pressure.

As a result of this discovery, in the 1930s especially, he made a number of electrical machines which were said to be able to generate specific tunable frequencies. By stepping through a range of frequencies while observing his virus particles with his microscope, he could find one which "devitalized" the cancer virus, which literally exploded, or at least became inactive in producing the disease. He described experimental work which created tumours in rats, and then repeatedly destroyed them with his machines.

When such a machine [which has been described as a plasma emission device] was applied even to the body surface it was said to be successful in curing various cancers.

Some medical men supported his contentions, which were widely and sensationally reported, largely in the popular press as above, before WW2. His results were questioned by the American Medical Association, but to the present day some believe in them. Of course, conspiracy theories abound as to the suppression of his results and instruments, it being stated that the medical and scientific establishments had and have vested interests in not allowing a cure for cancer to be found too quickly!

He published virtually nothing in the scientific press, which detracted from any reputation he might have earned among established scientists. There are no mentions of any of Rife's work in the learned press post the mid-1940s. Rife developed his frequency device further in the 1950s, but financial and legal difficulties loomed large, and for a while he seems to have lived in Mexico, for economy. After the death of his first wife, he married Amelia Aragon in 1960, possibly in Mexico.

Rife died penniless on 5 August 1971, in a hospital in La Mesa, near San Diego. Accounts of his life and work have been provided, in popular form, by Lynes [2], and by Farly [3].

The first and second Rife microscopes

The first was revealed in a little detail in 1931, although it had been under development for a decade by then. Much of what is recorded here about this instrument, number 1, comes from remarks made by Professor Hubbard, who was professor of pathology at the State University of New York, in Buffalo, and who had been interested in these microscopes since 1947. He visited the Wellcome Museum to see their microscope [number 5] in 1978. Hubbard possessed photographs of microscopes 1 and 2. The first was mounted horizontally on an ordinary optical bench, while the second seems to have been a vertical version of the first.

The first stand was illustrated in newspapers of its time [using a picture identical with that possessed by Hubbard] such as with the article in the *Los Angeles Times* of 22 November 1931, an extract from which is recorded above. From what can be seen in this photograph [which is too poor in quality to reproduce here], a triangular-section optical bench carries what could be a high-pressure light source in a lamp-housing, with quite an ordinary stand beyond it.

It is quite unclear how the magnifications of 17,000 times reported in the newspaper above could have been achieved, but if I was to try to do such a thing with a light microscope I would start with a 100x immersion objective and use an astronomical eyepiece [60x is quite usual] with it. This would easily provide a 6,000x direct visual result, and viewing the image with some extra extension in the body-tube would bring it up to the stated value. Such a result would provide empty magnification on a spectacular scale, of course, but if a non-expert was looking at the image he wouldn't know this. It cannot now ever be clear if Rife himself did not know this, or if he did know but simply wanted to impress, regardless.

For photographic results, merely enlarging a negative made at a few thousand times magnification would provide spectacular final magnifications - and it is only such a final value which would be needed to impress, regardless of any accompanying deficit in resolution.

He would not have been alone in not actually knowing. Even very prominent medical men totally failed, and still fail today, to understand the workings of the microscope, so the mere fact that a surgeon or other specialist endorsed the work was no endorsement at all, in real fact.

A decade ago I was concerned with a medical man in a prestigious European research institute who provided highly-magnified pictures made with a light microscope: they provided regular patterns of structure which had never been demonstrated before. I found that they were made by enlarging further his original transparency [already made at great extension], sometimes in two or even three successive stages! It took a lot of persuasion on my part to convince him that what he was magnifying was merely a dispersion of dye particles in gelatin, and *not* in the original structure he thought he was demonstrating. Others in this country, also, have had to be persuaded that pictures they sent in to this Journal, made in a similar manner, simply wouldn't do.

Microscopes one and two, Hubbard stated, were cannibalized to make stand three, and thus nothing further can be said of them.

Rife three, the "Universal"

This was his masterpiece, called the Universal, made in 1933. Fig. 1 is a contemporary photograph of this instrument, in a shot made to impress rather than to inform. This instrument was among several described in a paper published in a prestigious journal in February 1944 [4], and shortly afterwards reprinted with a few alterations in the *Annual Report of the Board of Regents of the Smithsonian Institution.*

This original paper requires consideration in some detail. It included remarks on a range of instruments, including the electron microscope [then very new], on pages 103–109. Then remarks on resolution and magnification of ordinary microscopes on pages 109–113. This was followed by a discussion on the "reduction in the theoretical limit of resolution", as demonstrated by the Graton-Dane microscope [which was mounted on a 360 kg steel bed in the geology department at Harvard University] and was stated to be able to produce "resolution of up to 6,000 diameters and magnification of up to 50,000 diameters" [!]. Those using this instrument "expressed doubt as to the complete validity of the generally accepted theory of resolution." No doubt they did.

J E Barnard in England is stated to have "succeeded in obtaining resolution up to 7,500 diameters with his ultra-dark-field scope in which he uses a combined illuminator."

This is the tenor of the remarks by these authors before they get on to the Rife Universal Microscope, to which they devoted the rest of their descriptions, pages 116 to 127. It is only too clear that they lacked even a basic understanding of the theory of the microscope. Not only did they then go on to describe the instrument, but they went into a lot of detail about the findings of Rife and his associates as to the nature of disease particles.

They say that the instrument consists of 5,682 parts, with all optical parts made from quartz [p. 117]. It is also worth quoting, before we go any further, what they say on page 118 of the objectives used with this instrument: "The objectives used in the Universal Microscope are a 1.12 dry lens, a 1.16 water immersion, a 1.18 oil immersion, and a 1.25 oil immersion." Oh dear!

I have to conclude that what these authors said of the various instruments shows that not only were they were entirely ignorant of the physics of the microscope, but very easily duped into the bargain. Crucially, it is their paper published in a reputable journal which has been held up as [virtually the sole] proof that the scientific world accepted Rife's claims as to the performance of his microscopes, and his findings of disease-inducing particles of bacteria!

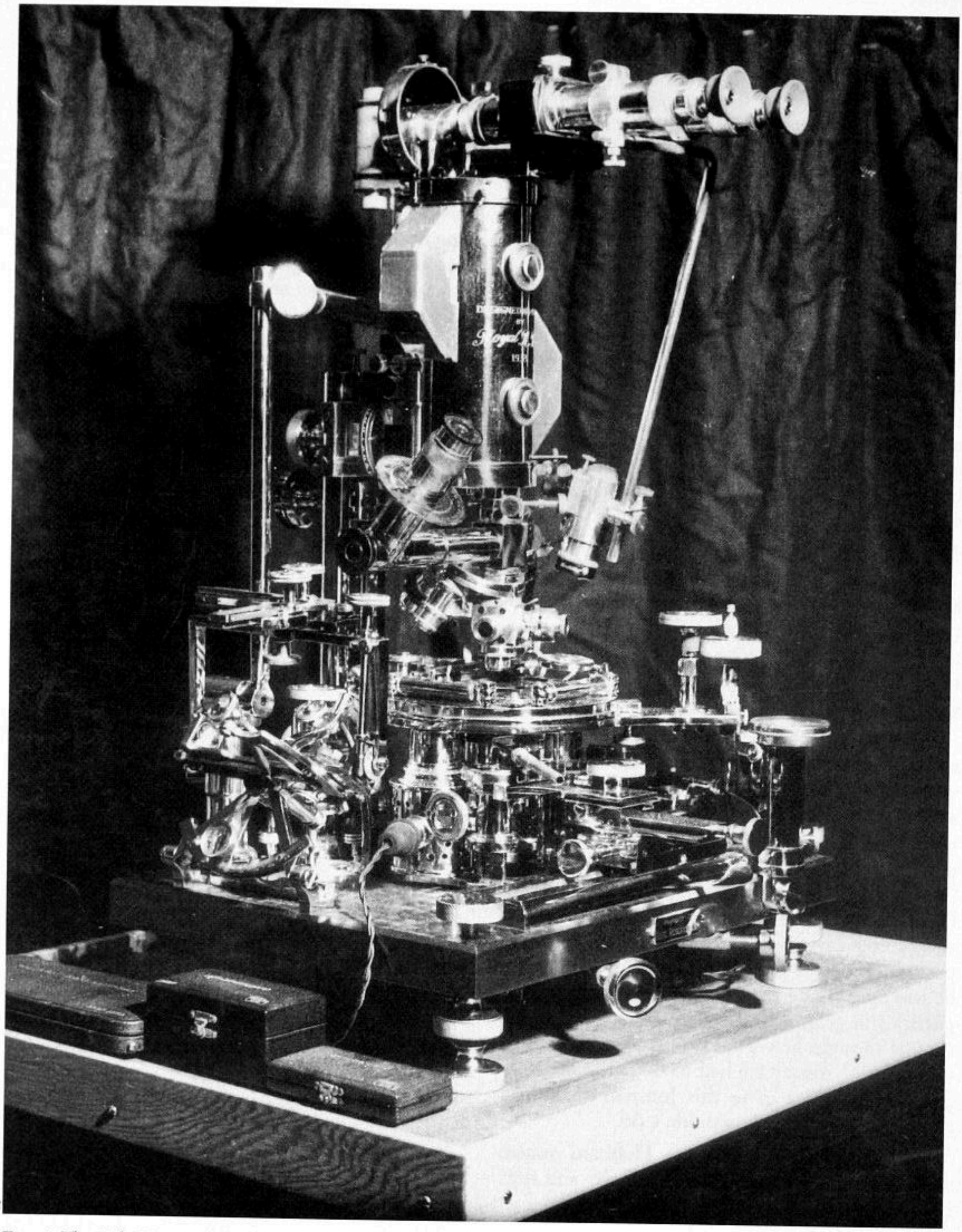

FIG. 1. The Rife Universal Microscope of 1933.
The original picture seems to have come from Rife himself, and shows off the instrument in a way calculated to impress.

Let us return to the Universal stand itself. It was fitted, in what was really the best English tradition, to allow for transmitted, dark-ground, polarized, and slit illumination, with a monochromatic source in addition. The lamp is said to have been a high-intensity incandescent source, and we must return to Rife's patented lamp of 1929 below. There was a Risley prism and an achromatic condenser of NA 1.4. The prism consisted of two circular rotatable quartz wedges said to have bent the rays at variable angles of incidence and to produce virtually monochromatic illumination of wavelength variable at will. It was further said in the Franklin Institute paper that the rays of light proceed up the body tube "through twenty-one light bends to the ocular", and we may investigate this statement below when we consider Rife five. It was said that the effective tube length was 449 mm, in a physical length of 229 mm. The eyepieces were said to have focal lengths of 10 mm, 7 mm, and 4 mm "which make possible not only the unusually high magnification and resolution but which serve to eliminate all distortion as well as chromatic and spherical aberration". The eyepieces would have had effective magnifications of about 50x, 70x, and 125x under the conditions in which they were used, and as for eliminating aberrations, no more need be said.

The graduated circular rotating stage had a mechanical stage attached with some kind of arrangement for tilting. The whole instrument stood 24 in. high and weighed 200 lb., with a fine adjustment stated to be 700 times more sensitive than the usual versions. It is further stated that it could take any time up to 90 minutes to focus the image!

Fig. 2 shows the instrument set up in Rife's laboratory, with all the background equipment apparently being for providing the illumination. Figs. 3, 4, and 5 are from the paper itself, showing some of the results. The paper also provided a list of references. Three were by Rife, and were stated to have been "presented" on given dates, without further details. The other by Rife & Kendall is listed in my reference section [5], although I have not been able to find a copy to read for myself.

Similarly, I have not seen the Rife 3 instrument for myself, but I have seen an account of it from someone who personally examined it in detail. Professor Ronald R Cowden, Emeritus Professor of Biophysics at East Tennessee State University had been appointed in the later 1980 s to act as consultant on the possibility of restoring it: it was then owned by Rife Laboratories Inc., of which Mr Barry Lynes of Mission Viejo, California, was president [see ref 2]. Professor Cowden saw the instrument in August 1988. Mr Lynes had obtained Rife 3 from John Crane, who had been imprisoned for offering a bogus cancer cure

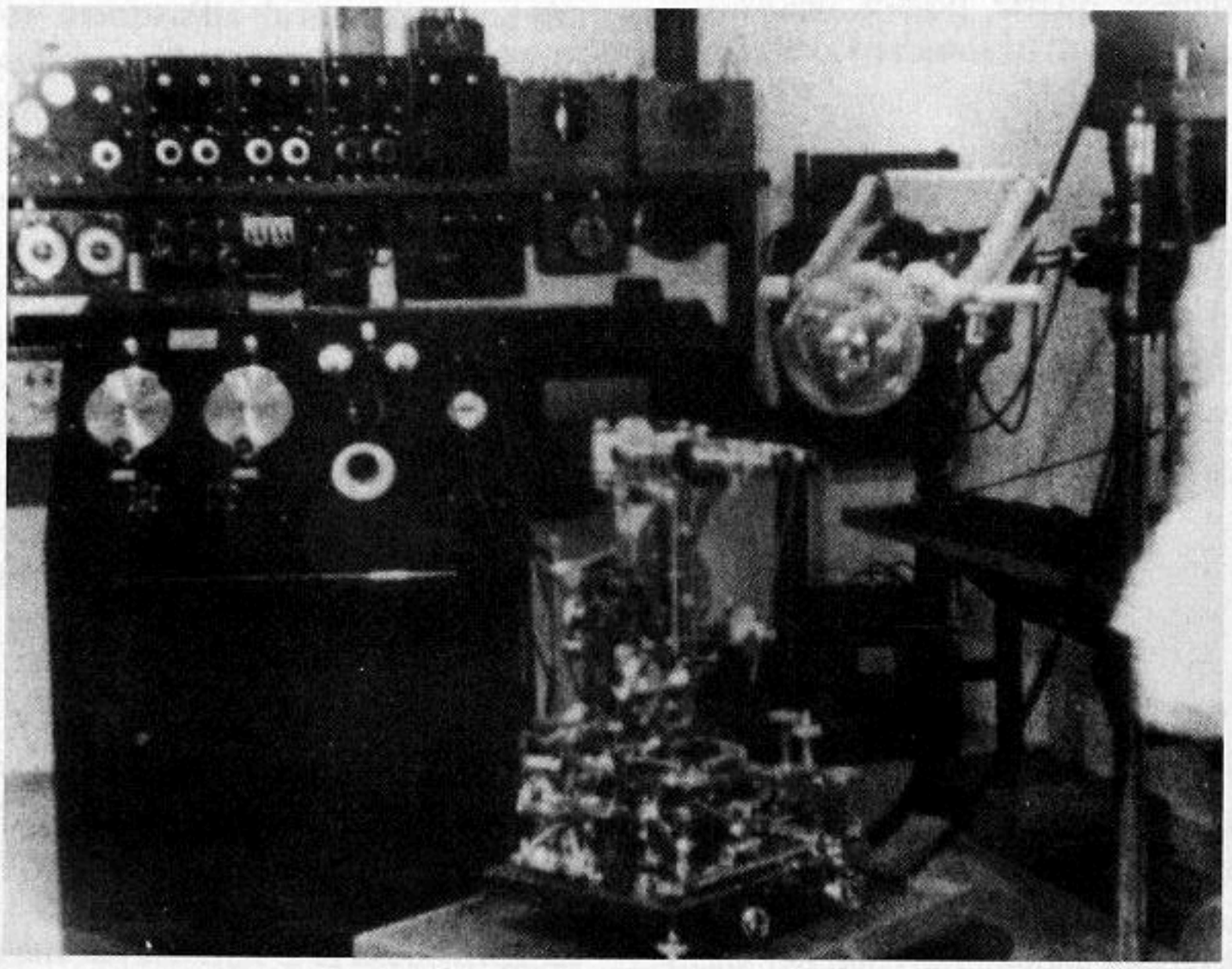

FIG. 2. A photograph made in Rife's laboratory about 1935, showing the Universal on a low bench in front, and what seems to be a high-tension apparatus providing current for the source suspended in mid-air at the side.

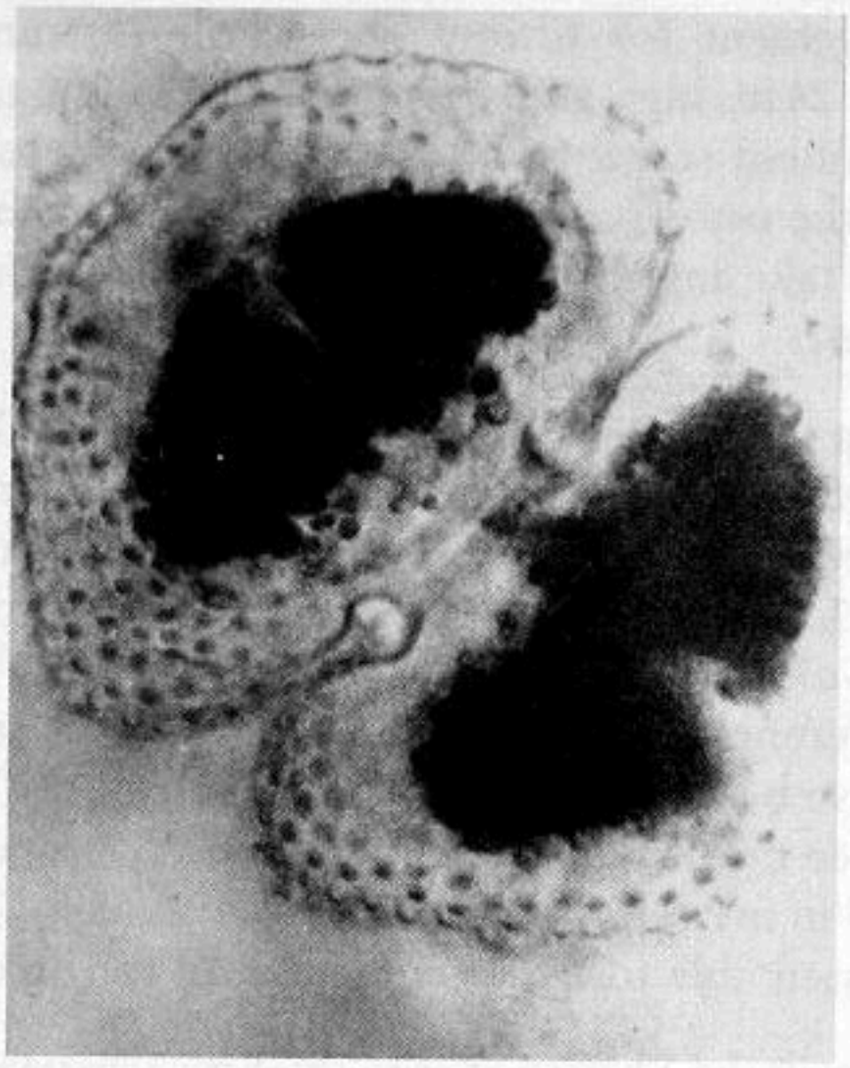

FIG. 3. Plate on page 116 of the Franklin Institute Journal paper.
The caption reads: Chlorophyl Cell [algae] [The Universal Microscope]. 17,000x on 35 mm. film.
[Height of plate as printed: 117 mm].

[the Rife machine], and who had removed it from Rife's laboratory after Rife's death: he had been closely associated with Rife during his lifetime.

Cowden considered it to be an extensively modified American Optical research microscope of about 1932 vintage. It had a mercury-arc source, and a pair of slanted quartz prisms below the condenser, which itself was of standard glass Abbe

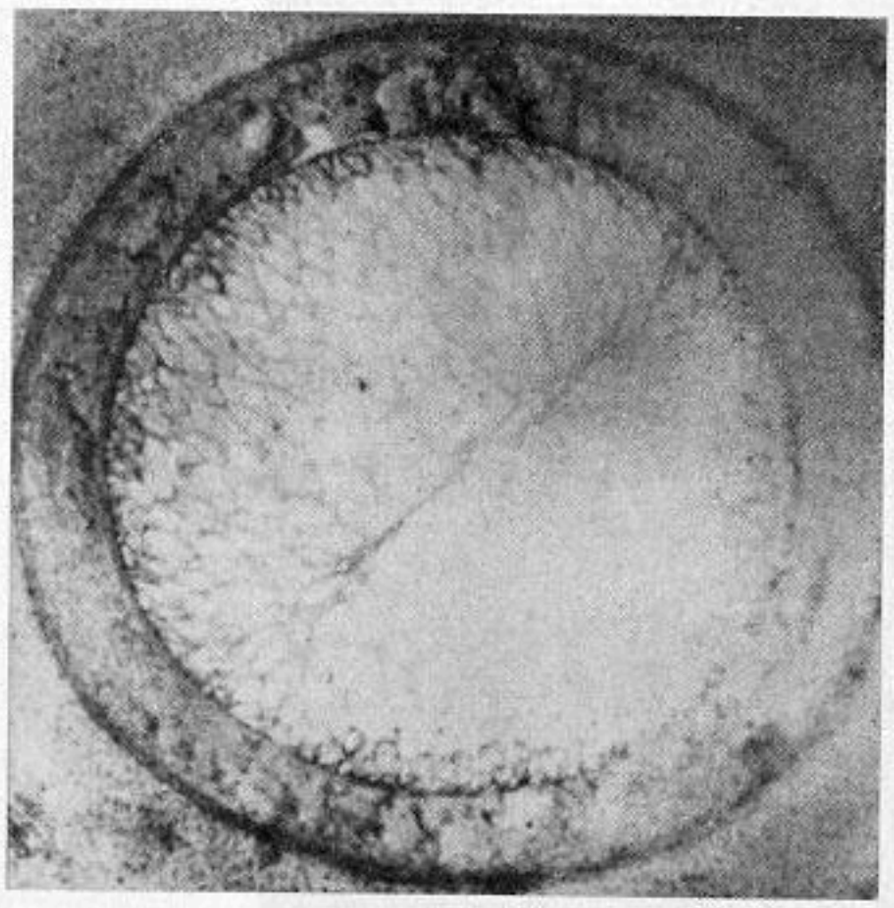

FIG. 4. Plate on page 122 of the paper.
The caption reads: Tetanus Spores [The Universal Microscope]. 25,000X on 35 mm film, enlarged 227,000X.
[Height of plate as printed:118 mm].

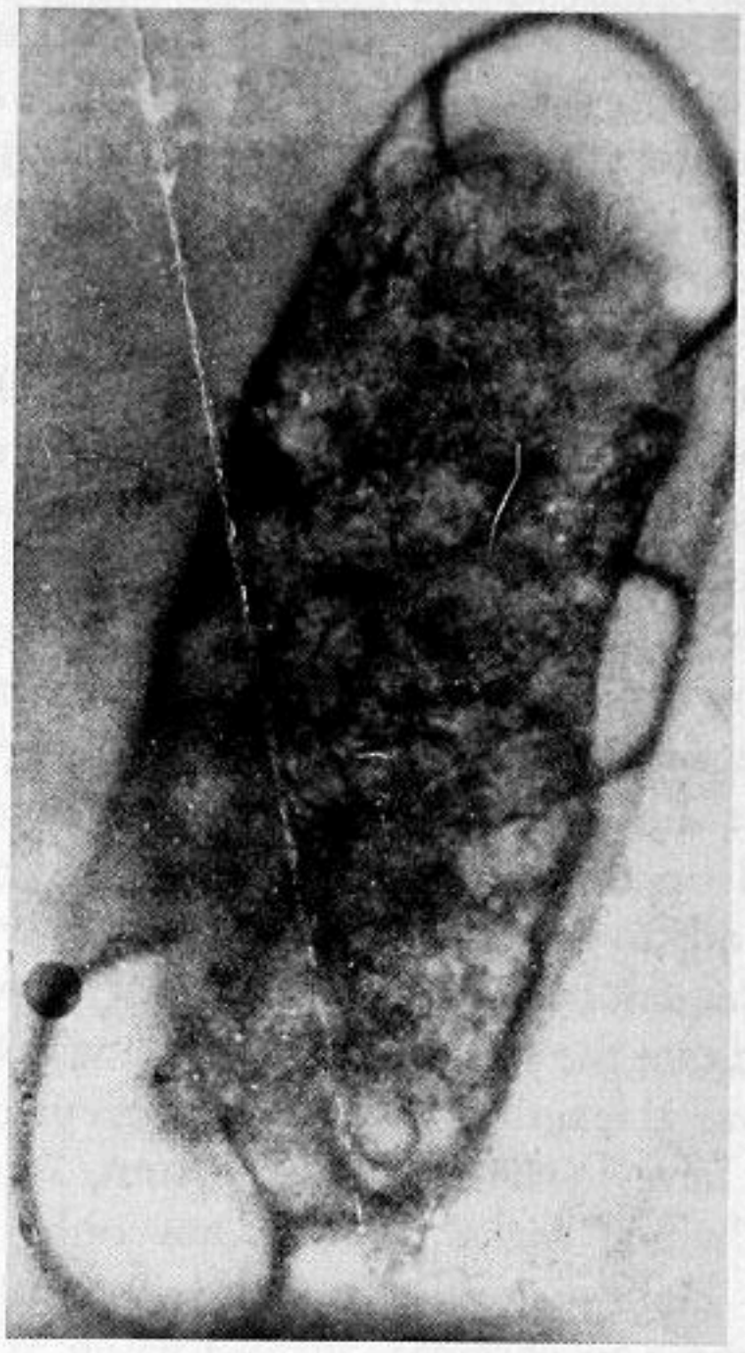

FIG. 5. Plate from page 125 of the paper.
The caption reads: Typhoid Bacillus [The Universal Microscope]. 23,000X on 35 mm film, enlarged 300,000X.
[Height of plate as printed:118 mm].

construction. The stage was similar to those found on polarizing microscopes of the day, and almost every part of the instrument had some sort of minute mechanical adjustment to allow tilting, rotation, centring, and/or focussing: Cowden considered it to be a mechanical nightmare! The objectives were conventional AO or Leitz, and there were no special inserts above them. The light path led straight into a prism train inset into a tube about 300 mm long, and which had contained a central element then missing: it is not known when it was removed or what it was. Above the train was a right-angle prism and a goniometer and a straight AO binocular tube. The glass prisms above the light source port could not have transmitted wavelengths below about 360 nm.

Cowden also had opportunity about 1990 to look at Rife 5 in the Museum, and said that Rife 3 was similar but more complex, to the extent of appearing complex for the sake of complexity. His final judgement was that Rife 3 was a flawed design at best. It is difficult for me to dissent from that view, in the light of my findings from examining in full detail Rife 5.

Rife four

Details on this stand are far from clear, but it seems to have been brought over to England by a Henry Siner in or about 1937, to be looked over by a Welbeck Street medical man, Dr Bertram Winter Gonin [1874–1957]: it seems that Gonin was seeking to buy the Rife instrument. Siner is said to have stayed in England until about 1940, when the microscope also went back to the USA, although not necessarily with Siner. Gonin's daughter later said that her father was unable to obtain any results from the instrument, and neither could he from the ray apparatus he also bought. As with virtually every matter connected with Rife, half-truths and untruths abound!

The background to Rife five

Although the instrument itself is in the collections of the Science Museum, thus allowing its physical make-up to be determined once for all, its history is murky. Dr Gonin's daughter stated that he collected the instrument from San Diego in 1956, although it is signed as being designed and built by Royal R Rife in 1938. Gonin certainly paid over quite a lot of cash to Rife before WW2: see Figs. 6 and 7 for one example of a letter in this regard. However, the microscope which went to Gonin in England [Rife 4] couldn't be made to work by him, and this may be why he went in person to Rife eighteen years later to collect Rife 5 in lieu.

However, it was in July 1977 that Tony Duggan, director of the Wellcome Museum of Medical Science in the Euston Road, visited Miss Gonin at her late father's home in Shortlands, Kent, in the company of Dr Bird of the London School of Hygiene and Tropical Medicine. It was during this visit that she offered them the microscope, partly on account, it may be, of some pressure from one or more organisations in the USA, who were trying to get hold of it. Although her father had worked in his medical practice in Welbeck Street, he worked with the microscope only at Shortlands, in conditions of some secrecy. The instrument was actually given to the School of Hygiene, but was transferred by them to the Wellcome Collection at the Science Museum in 1990.

It is of much interest to note that what has also emerged from the several visitors who have called on Dr Duggan and others in regard to Rife from time to time, is that there is not a single microscopical preparation worked on by Rife, Gonin or anyone connected with either still in existence. Further, with the possible exception of a photograph of phage, there is no actual proof that any photomicrographs were ever taken with any of the Rife microscopes.

A number of qualified men seem to have seen Rife use his Rife 3 stand, among them E C Rosenow, head of the Mayo Clinic research effort on micro-organisms, who in a letter dated 11 July 1932 implored him to "take the necessary time to describe how you obtain what physicists consider the impossible as regards magnification, and submit your paper to a suitable journal for publication." Rife never did any such thing, of course. The usual explanation has been that he was too busy in getting results to write them up, but this has a very hollow ring to it. I personally am beginning to be convinced that his results were obtained by fraud of some kind, when there would be every incentive to avoid publishing anything, especially in a refereed journal.

Rife five: the lamp

The instrument is contained in a mahogany case, in the form of a thick base and lift-off top, secured by four locking clips: dimensions 315 × 295 × 558 mm. The instrument-base proper sits on three feet within the wooden base, which contains Rife's patent lamp [Fig. 8]. This requires some description.

The top rim is engraved: THE RIFE MICROSCOPE LAMP PAT. NO. 1727618. And indeed US Patent 1727618 was issued to Rife in 1929, covering this design. The patent specification states that the lamp was [1] to be put directly below the stage, [2] fitting into the gimbal of the mirror, [3] to be of variable intensity, [4] of ample intensity for the highest powers, [5] to be an integral part of the instrument, [6] to provide superior uniform and flat illumination, [7] to be well ventilated, [8] to provide non-fluctuating light, [9] to be simple, neat, easy to install, durable and reliable.

The result is seen in the figure, and while one might have supposed that such a specification would necessarily require an elaborate and ingenious device, such is not at all the case. What we have is a simple nickel-plated cylinder, perforated for ventilation, with a sleeve on the side to carry a slide-in socket in which is an ordinary 6v18w automobile lamp. In use this fits over a button in the mahogany baseboard of the stand. In fact, this lamp is so far short of satisfactory, and so

MR. B. WINTER GONIN.

WELBECK 3140.

39, WELBECK STREET,
W.

10th October, 1938.

Royal Raymond Rife Esq., Ph.D.,
708, Electric Buildings,
San Diego,
CALIFORNIA. U.S.A.

My dear Dr.Rife,

It seems almost an eternity since I heard from you, and a long time since I sent you anything towards the Microscope, so I am sending you by today's post 500 Dollars through the Bank of America, San Diego, who will no doubt advise you in due course.

I should also like to know when you require any further money, as I do not want the microscope to be held up by any question of finance.

Do you think you will be able to come here as was originally arranged about the first week in December? I need not tell you how important this is from our point of view, nor how welcome you will be.

The machinesfrom the Beam Ray Co. arrived only last Monday, and are completely useless as far as we are concerned, - as you will no doubt have heard from them through Dr.Parsons. The understanding was that they should be dispatched in July, in order to arrive here in time for my return. There has been therefore an unaccountable delay of two months which has very seriously unsettled my plans.

Having arranged for all monies necessary in order to finance this scheme largely, I am quite unable to accept any of the monies offered, since we are not yet satisfied with the machines. Not only are they faulty in construction, but they give out nothing but harmonics, even though they have been put together.

In many cases the wires were not even attached or soldered, but I think our friend Dr.Parsons will have explained this. Nor has Mr.Hoyland in fact, sent us the exact frequensi

FIG. 6. Page 1 of a letter from Gonin to Rife dated 10 October 1938.
This shows that Gonin had ordered a microscope from Rife, and was sending him $500.
[This was the equivalent of about £10,500 in today's money]. This was evidently not the entire sum due, either! We see also that Rife was due to come to England, but there is no record that he ever did. Further, Gonin had ordered machines from the Beam Ray Company, and they ha . arrived late, incomplete, wrongly wired, and with the wrong frequencies, but already paid for!

and those that he has sent, I believe differ from yours.

I have therefore, for these reasons, been unable to do anything with your cultures, beyond keeping them in an incubator at 27° centigrade.

I think you will understand the exact position from this, for I am sure you will agree with me that it would not be right to accept money from anybody for the purpose of paying in money to the Beam Ray Co., until such time as the machines they have supplied carry out the work for which they have been intended. I must say I am tremendously disappointed at all the time and energy wasted by these delays, for it is now over 5 months since we set out for San Diego, and we are hardly more advanced than we were then.

I have asked Dr. Parsons and Mr. Blewett to give the Beam Ray Co. notice that I will not carry out the terms of the contract owing to their serious delays, and I think it will be at least one month before we should consider any further paymer to them at all.

Have you any news for me about the virus of arthritis and its frequency, or of measles and its frequencies?

With my very kindest regards to Mrs. Rife and yourself, and to all my friends in San Diego,

I am,

Yours very sincerely,

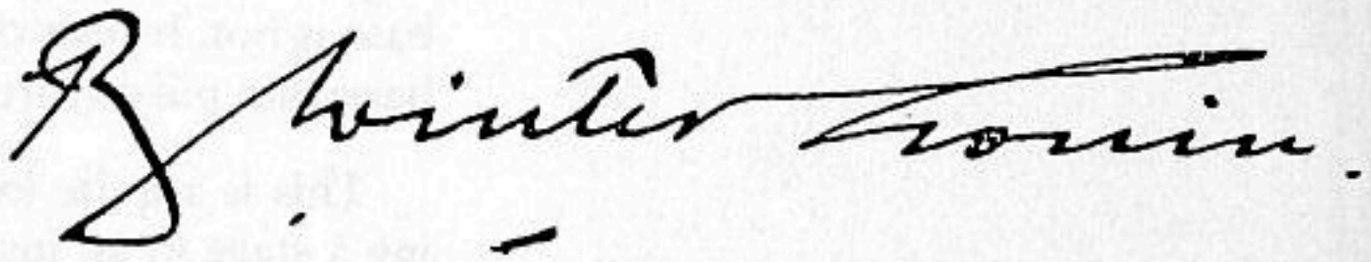

FIG. 7. Page 2 of the letter of 10 October 1938.
From this page it seems that Gonin had been prepared to set up a company of some kind to import the ray machines, which seem to have been intended to stimulate growth of cultured [cancer?] cells. Gonin actually had some of Rife's cultures but could not progress with them as the ray machines didn't work. Clearly, Gonin had been out to San Diego, but had very little to show for it.
The microscope, Rife 4, he was paying for was unsatisfactory to him when it arrived, as shown in my text. It is known that some of the Beam Ray machines were eventually installed at Gonin's home, for they were seen there by Dr Duggan when he visited Miss Gonin in 1977.

unoriginal compared with commercially-available British designs of its day, that it is surprising that it could answer in terms of its patent. It certainly does not do so in cases [4] and [6], and it is hardly an original concept into the bargain. For the high-power uses to which it was supposed to have been put, the intensity is so low as to be useless.

Rife five: the stage

The height overall of the assembled instrument is 485 mm; the baseplate measures 223 × 255 30 mm; and the body-tube is 160 long × 72 mm diameter, and signed: DESIGNED AND BUILT/ BY/*Royal R. Rife*/1938

The base of the stand is a very heavy cast steel plate to which are attached various pillars and two levelling feet [Fig. 9]. At the rear is the heavy pillar which carries the body-tube. In front are two fixed pillars with dovetails to take two of the stage points, and a third pillar with dovetail to take the third stage point: this pillar adjusts for height by a micrometer screw. A fourth pillar, attached to the

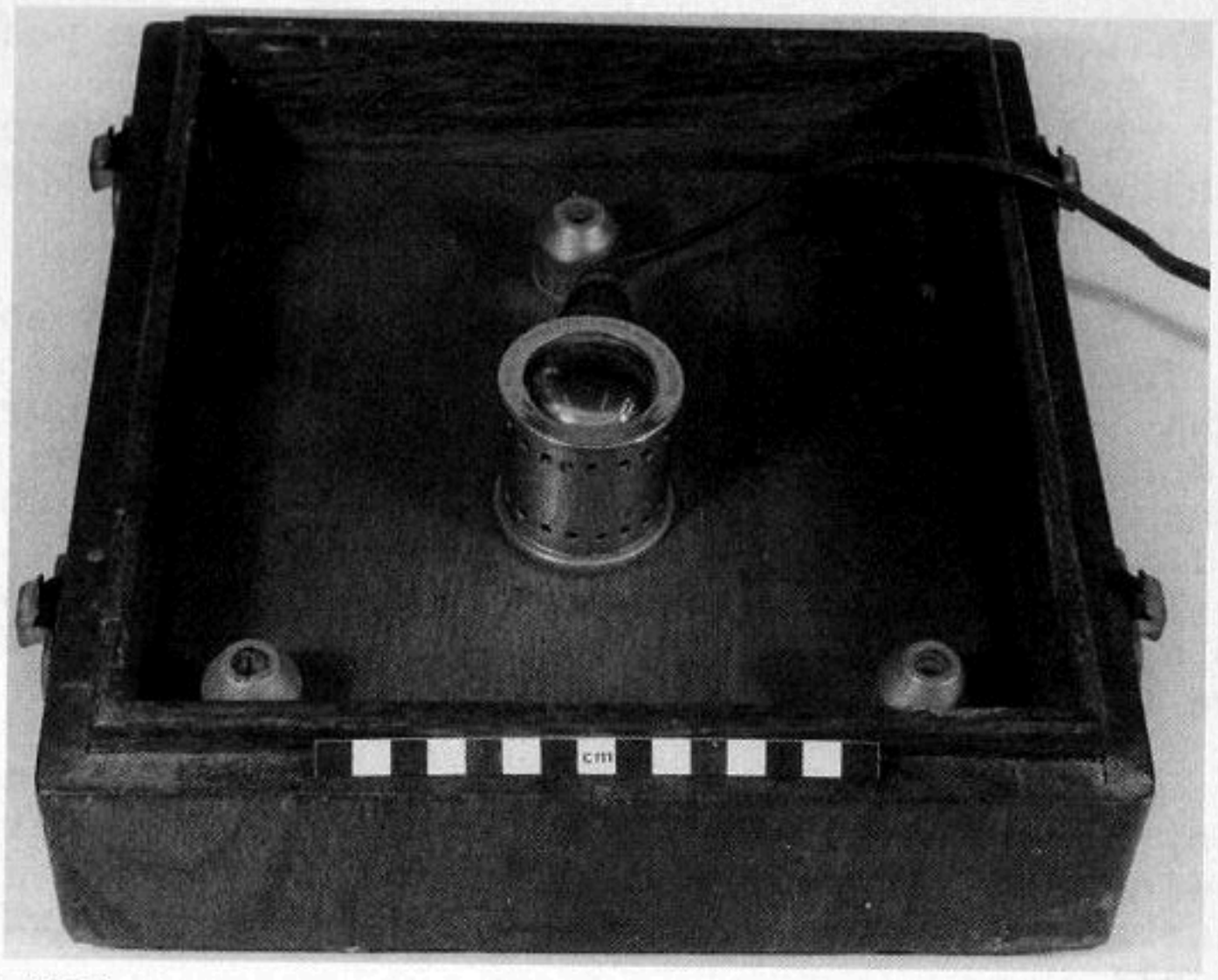

FIG. 8. The baseboard of Rife 5.
This shows the mahogany part holding the simple lamp-holder, and the supports for the steel base. The scale is in cm.

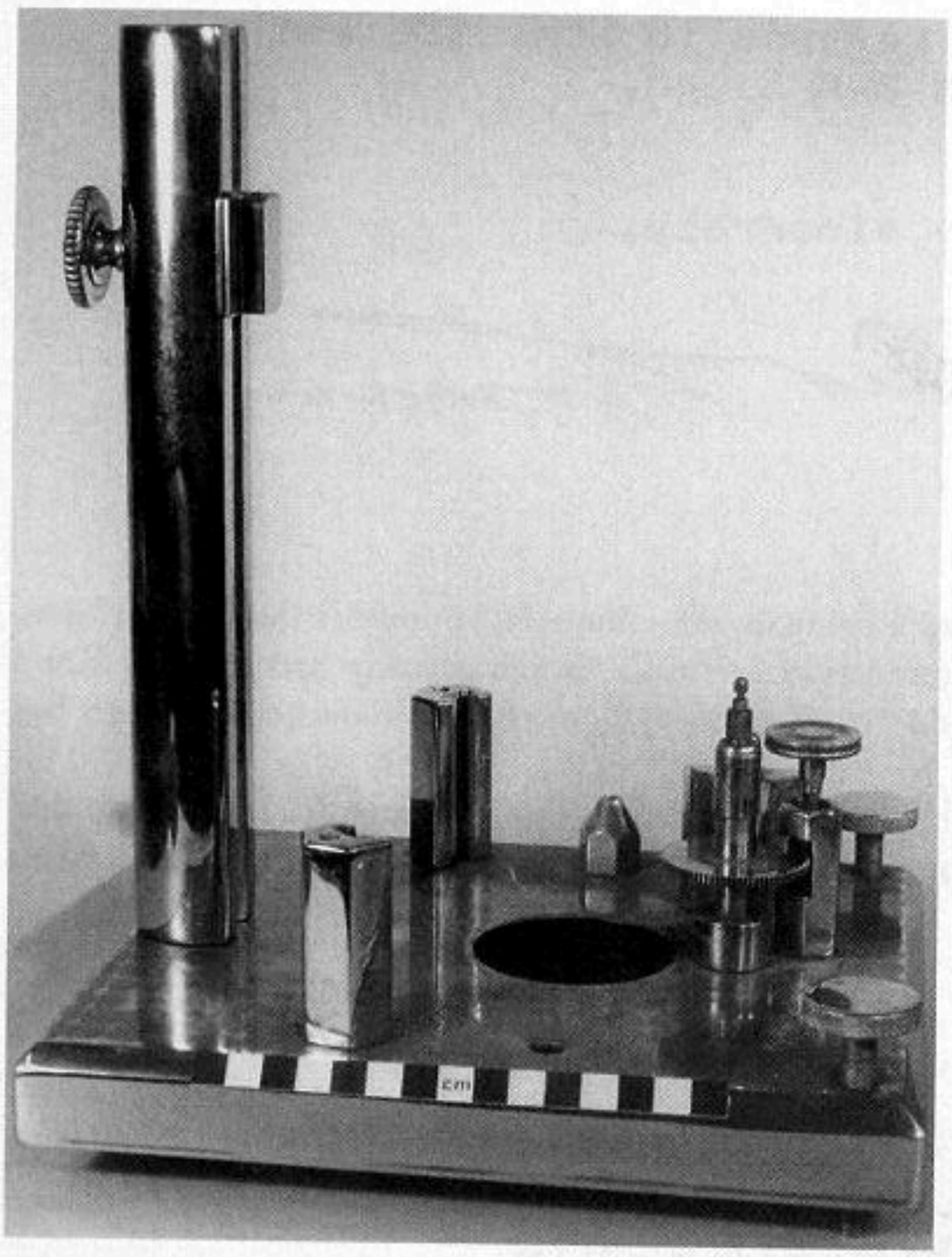

FIG. 9. The base and columns of Rife 5.
Three stage supports, one main column, two levelling screws, and the substage support are all attached to the heavy steel base by single bolts.

baseplate by a single bolt as they all are, carries the substage. The stage itself is strongly reminiscent of designs of its day by Zeiss or Reichert, and certainly could be of their manufacture [Fig. 10].

It is circular centring rotating with mechanical movements in both axes, readable by vernier to 0.1 mm, and in degrees on the circumference readable by vernier to 0.1°. While the top plate is quite ordinary, its method of attachment to the base is not. It rests on three points, carried on the baseplate pillars already described.

This is a quite extraordinary means of attaching a stage in an instrument claimed to be of the highest precision: there is simply no guarantee that the stage will attach on a defined optical axis, and it is very easy to jog it slightly at right angles to the axis when in use. It looks good when attached, though, as shown in Fig. 11.

This figure shows the generally chrome-plated appearance of the stand perfectly. Such a finish is absolutely unhelpful in an optical instrument, guaranteeing as it does that any stray light *will* be reflected all over the place! On the other hand, if a stand was to be made to impress in a Hollywood movie, then it would be designed in just this way.

Rife five: the substage

Figs. 11 and 12 show the details of the rack and pinion focussing working the ordinary two-lens Abbe illuminator in place. It has a swing-out iris worked by a wire from the side, and a rotating polarizer wedge below. There is no kind of alignment of parts, unless done again for each

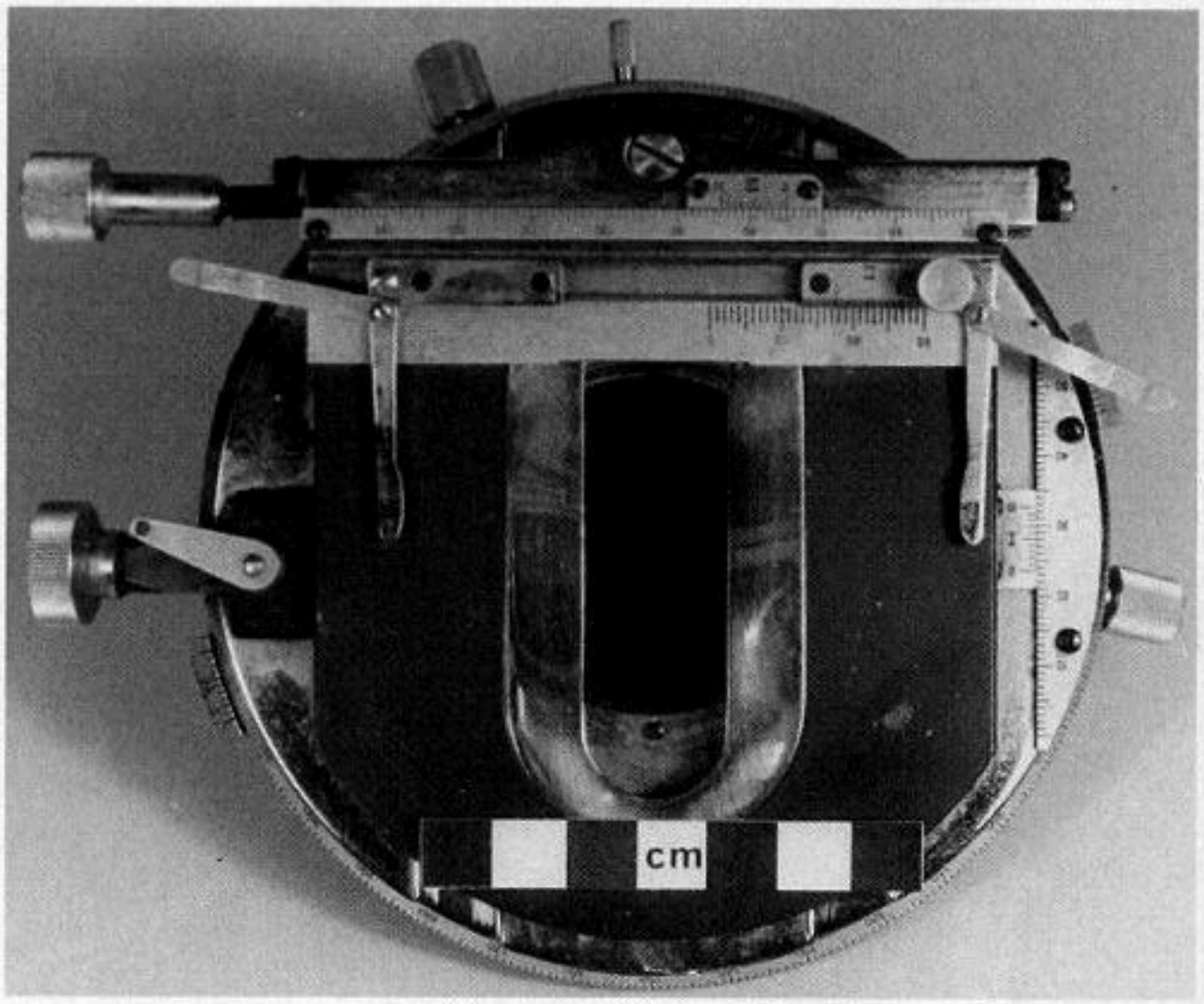

FIG. 10. The stage of Rife 5.
A perfectly ordinary seemingly commercially-made centring rotating mechanical stage with verniers.

set-up, which would be tedious in the doing, and uncertain as to continuity.

There is, of course, no guarantee of any kind that the components now in place were those, or even of the kind of, originally fitted in 1938: it is perhaps unlikely to be so. However, from what seems to be built-in, such as a decentrable iris, and one which so far as can be seen is not at any particular conjugate plane, whatever might have been fitted by Rife was nothing extraordinary. This is disappointing, for Rife seems to have placed much emphasis on his substages, and claimed an ability to secure monochromatic illumination at virtually any wavelength on demand. He certainly didn't do so with this apparatus.

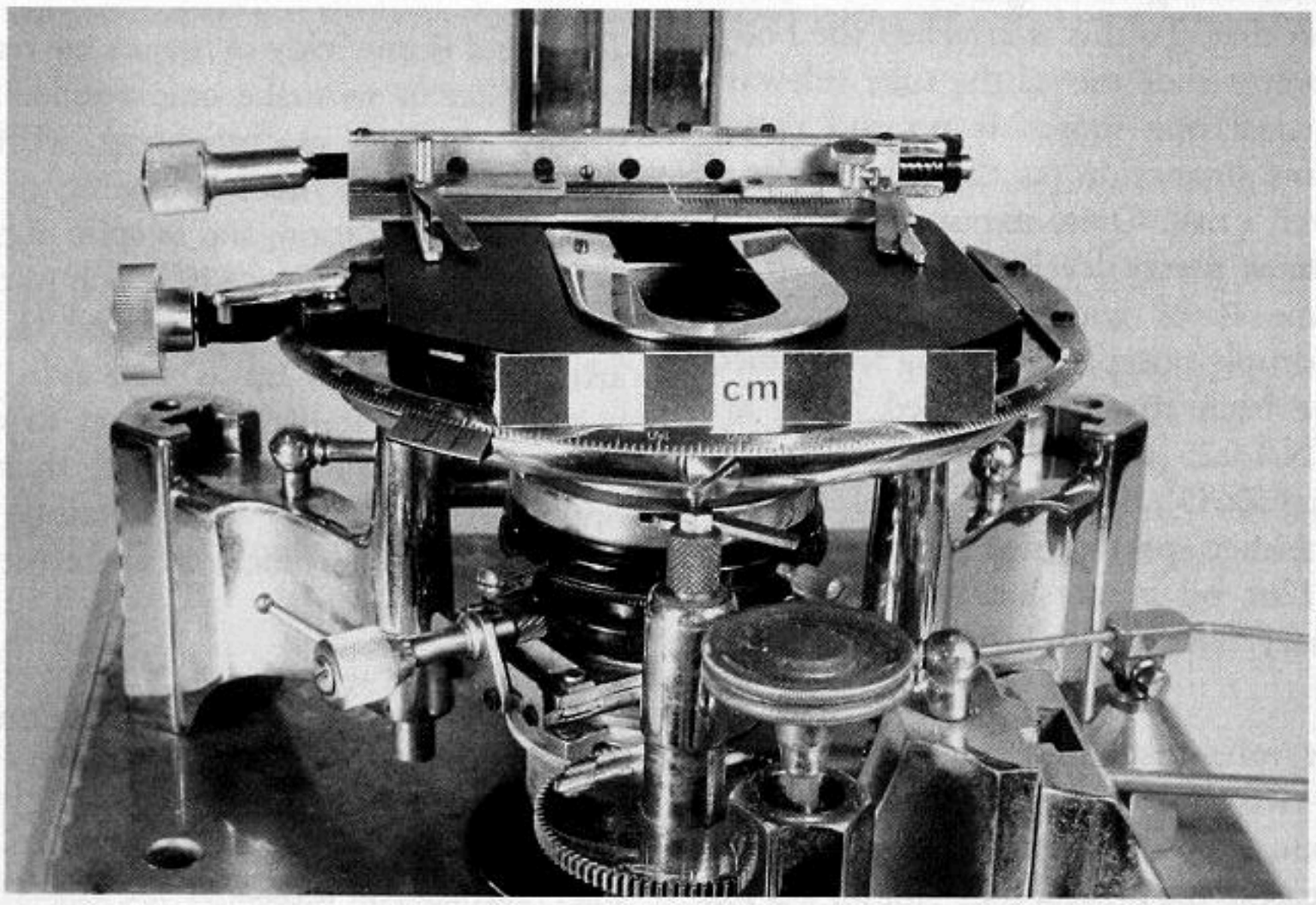

FIG. 11. Below the stage of Rife 5.
Details of the stage supports are seen, with iris decentring knob and the chromium-plated parts of the stage.

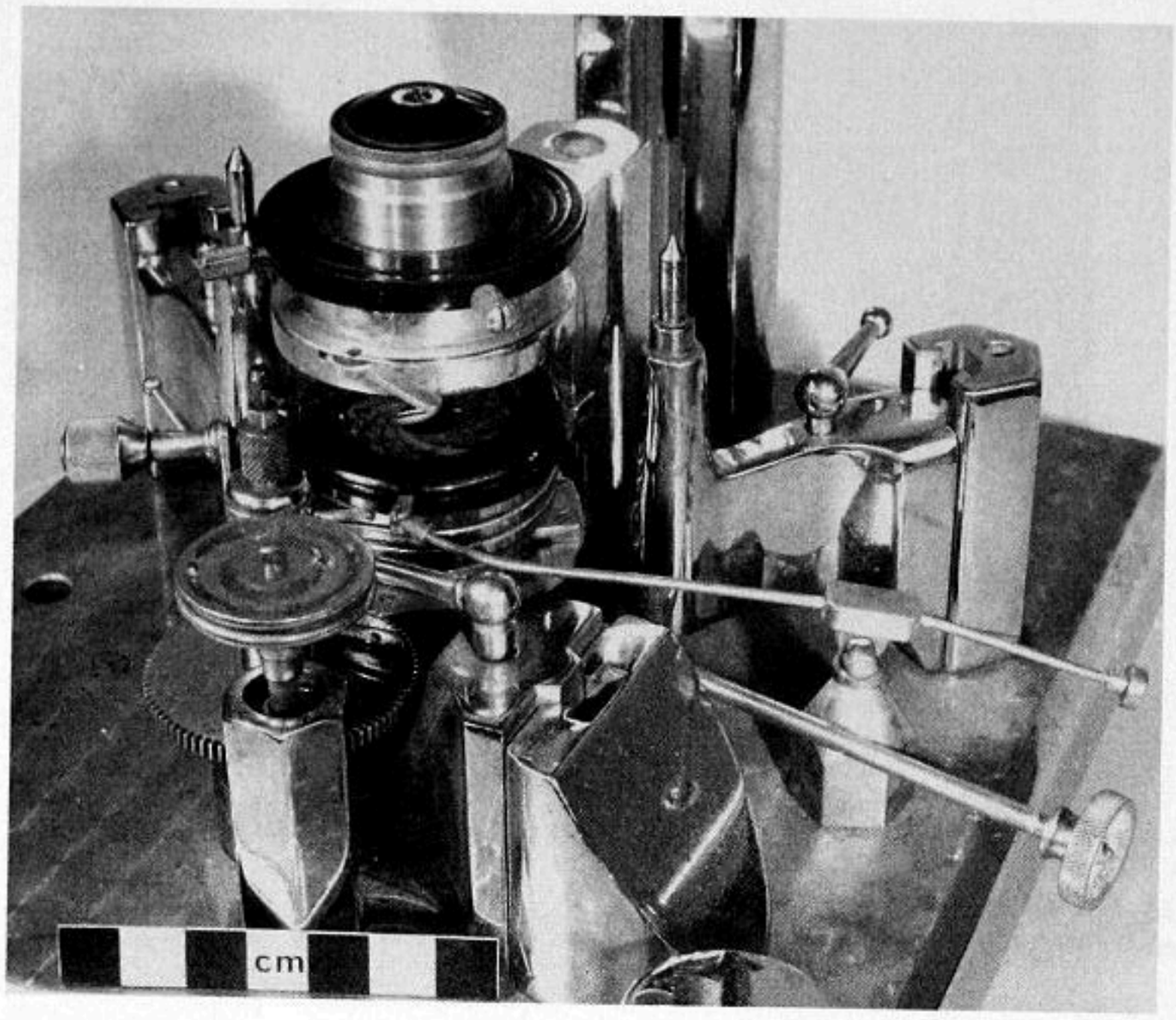

FIG. 12. The substage of Rife 5.
In this picture the control for the rotating substage quartz wedge are seen, with the wire to operate the iris, and further details of the stage supporting points.

Rife five: the body

Fig. 13 shows the assembled instrument, including the body-tube assembly. The rear pillar is attached in such a way, with one bolt, that it can rotate: it has a keyway along its length. In this runs a clamp, and another. To this is attached the body-tube. A transverse slide moves the tube sideways [!] and a vertical one moves it up and down. Neither is slow in motion, as they should be if for high-power work. Quite extraordinarily, the tube also rotates pretty freely about its vertical axis. The tube is of wide diameter, with an ordinary quadruple nosepiece holding four objectives: all have been chromium plated. They are Spencer 10x/NA 0.25 [serial 341039], Spencer 62x/NA 0.75 [serial 50645], Bausch & Lomb 1/18in. oil immersion [neither aperture nor serial engraved], and Leitz 1/12in. oil immersion/NA 1.32. These are all ordinary lenses with ordinary glasses in them.

The outer tube fits with wing-nuts top and bottom over two shorter inner tubes. These each contain a train of four prisms, which have the effect of increasing the optical tube length. On top is a further right-angle prism taking the rays into an ordinary [but chromium-plated] American Optical straight binocular tube now housing two Leitz 15x Periplan eyepieces, and held in a further slide.

Rife five: in use

The stand is unwieldy in use, so far removed from practicality as to make one wonder if its maker simply enjoyed machine-shop work to make gadgets? It takes much adjusting to obtain any passable illumination, and in spite of my considerable personal experience in bench microscopy, no satisfactory image was obtained in my several attempts. Once set up as well as it could be, it was very easy at higher powers to dislodge the stage or body-tube a fraction, thus losing the optical axis. I can say with certainty that no one could use this instrument to make a series of high-power observations.

Rife five: optical appraisal and conclusions

On taking apart the body-tube, the only odd aspect is that it is filled with prisms. That is the only odd optical aspect of the entire microscope, although there are plenty of odd mechanical aspects. I consider it to be filled with such

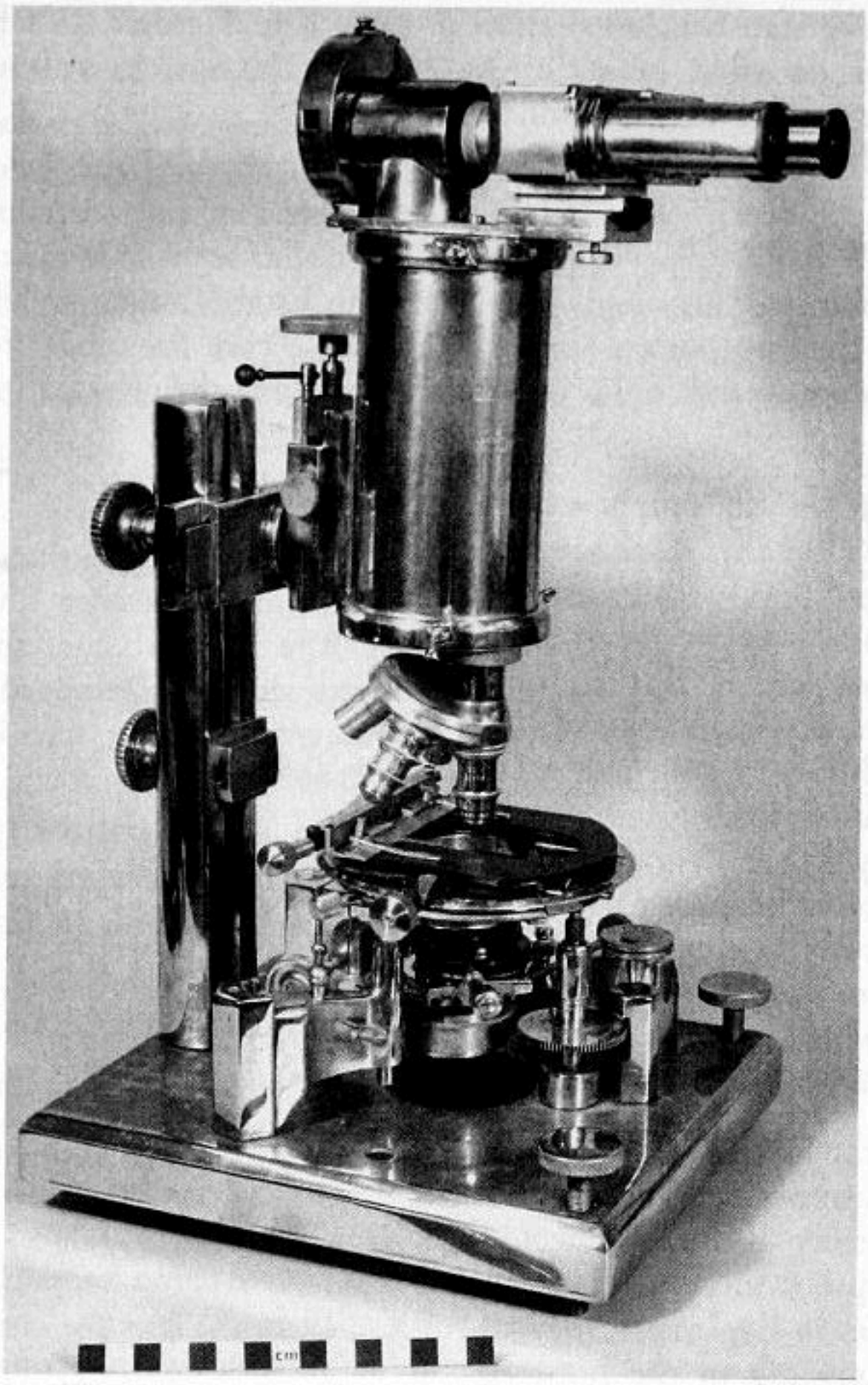

FIG. 13. Rife 5 complete.
The whole stand with an unusually-wide body-tube and a myriad of tilt and other adjustment knobs and controls, all being chromium-plated.

prisms only to increase the delivered magnification, as the prisms have the effect of increasing the tube length to about 210 mm.

I am not alone in thinking that the instrument could not have done what Rife claimed similar stands did do. On 7 December 1978, Dr Duggan took the instrument to the Department of Physics at Imperial College, where it was examined in detail by Professor Walter Welford. Duggan's written report includes the following:

> There seemed to be nothing particularly remarkable about the instrument except that it has been constructed in such a way [as] to make the work of microscopy tedious and cumbersome, particularly in respect of focusing the instrument. Using all the original optics it was quite impossible to obtain an image, but using a light source, eye-piece and objective from a Reichert microscope, a very imperfect image of leukaemic blood cells was finally obtained. The image was about 30 per cent larger than would have been expected with the use of a x6 eye piece and a x40 objective, and this was no doubt due to the prismatic arrangement in the barrel of the microscope. The resolution, however, was extremely poor.
>
> After more than three hours work we concluded that it would have been impossible to have produced the known photomicrographs with this instrument and it became clear to me that this explained the late Dr Gonin's complaint that he could obtain no results....
>
> One of the original photographs which was labelled "virus of cancer" was identified by Professor Welford as a well known artefact of optical systems known as "coma". It is merely a photographic rendering of an anomaly produced by defects in the optical system.

Thus, I personally have concluded that this example of Rife's microscope could not do what

he claimed it could. I have also concluded that his other stands did not do what he claimed they did, for the last three were all built in similar ways. Even if he could have produced accurate variable-wavelengths of illumination as he claimed, and it would be a big "if" sixty and more years ago, the capabilities of his stands were such as to militate against their utilization. Similar questions arise about the effectiveness of his beam ray machines.

I am loth to state that he was simply a conman, but it is abundantly clear that someone was up to something underhand. It is amazing that so very little actual evidence of effective functioning of any of his various devices is forthcoming. However, we do have some documentary evidence of this in his dealings with Gonin, which were far from straightforward. This wealthy English medical man wanted to buy not only one of the famous microscopes to use in his own researches, but also to set up a company to import beam ray devices. It is obvious from the letter included in this paper that Gonin paid over a lot of money to Rife, and in return got nothing that worked.

For a start, the beam ray machines which were sent over were completely non-functional. Now, it may be that this was accidental, but this would have been an amazing lapse if those in the USA hoped to capture a market in England. It may be that it was deliberate, possibly in the hope of extracting further cash to make them work in due course. It may also be that they simply could never have been made to work, and the sloppiness of their manufacture tends to support this supposition. Clearly, if they didn't ever work, the cat would be out of the bag! Someone was taking a considerable risk in letting such machines out of their hands, especially to go overseas where their use could not be controlled. The situation may have been saved only by the outbreak of WW2.

Similarly, when Gonin tried to buy a microscope, delays were encountered. When one was brought over in about 1937, it could not be made to work, in spite of having an expert from the company in England come with it. Apparently, Gonin had also been provided with Rife's cultures, but in the absence of functional beam ray equipment, he couldn't grow them. The non-performing Rife 4 was taken back to the USA on the outbreak of war, and over fifteen years after paying a lot of cash for a microscope, Gonin had to go to San Diego in person to get his hands on Rife 5 which had been made, so it seems, in 1938. Rife 5 didn't do what Rife said it would, either. This smacks of fraud on any reading.

Of course, in the climate of today, conspiracy theories abound, and I do not for one moment suppose that the foregoing account will satisfy those who see Rife as a crusader who was crushed by an Establishment which actually did not want to see a cure for cancer found too quickly, thus threatening their vested interests!

Acknowledgments

I am very pleased to thank Neil Brown, a senior curator at the Science Museum, for talking over the Rife file with me, and for updating me on events since I catalogued the Rife stand at the Museum some years ago: it has inventory number 1990-667.

This paper is based on my Savile Bradbury Memorial Lecture, delivered to Leeds Microscopical Society on 20 March 2003.

References

1. Rife, R. R. [1953] – *History of the development of a successful treatment for cancer, and other virus, bacteria and fungi*. Allied Industries, report Dev-1042. San Diego: Rife Virus Microscope Institute.

   [This is a very elusive publication, of which I have seen only a few snippets].

2. Lynes, B. – *The cancer cure that worked! Fifty years of suppression.* Queensville, Ontario: Marcus Books, 1987. ISBN 0-919951-30-9.

   This small paperback was written within three weeks by Lynes, who terms himself an investigative reporter. He had been impressed by a number of documents to which he had been given access, and a selection is printed as a series of appendices to the book.

3. "F Farly" [pseudonym of G F Foye] – *Royal R Rife, humanitarian, betrayed and persecuted.* Spring Valley, CA: R T Plasma Publishing, 2001. ISBN 0-9659613-1-1.

   This small book gives an account of J F Crane and others, who were convicted in 1961 of various offences in connection with selling unauthorized medical devices - the frequency instruments. Crane set up the so-called Rife Virus Microscope [or Microscopial] Institute, to market these units.

4. Seidel, R. E. & Winter M. E. [1944] – The new microscopes. A discussion, *Journal of the Franklin Institute*, **237**, 103–130.

5. Rife, R. R. & Kendall, A. L. [1931] – Observations on Bacillus Typhosus in its filterable state. *California and Western Medicine*, **35**, 409–411.

   I have not been able to find a copy of this very short paper to read for myself, but it is listed here as the only reference I know of Rife writing anything in a scientific journal.

Internet sites

These change rapidly, but the following provide a good start for those wanting more about Rife:

Rife Technologies: www.rt66.com/~rifetech/

Royal Rife Research Society: www.rrrs.com

Robert Cathey Research source:

www.europa.com/~rsc
www.navi.net/~rsc/index.html

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Cheltenham
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