Price, James Eastus. "Probing the Mind with Machinery." *Metropolitan Magazine* (date unknown), pp. 555-559. Gates's corrections to this article appear in bracketed small type.

[p. 555]

PROBING THE MIND WITH MACHINERY
by
James Eastus Price

SOME MARVELS OF MODERN SCIENTIFIC INVESTIGATION AS CONDUCTED BY PROFESSOR ELMER GATES IN HIS CHEVY CHASE LABORATORY

TWENTY minutes' ride from the Capitol in Washington brings the wayfarer to the northern boundary of the District of Columbia and a group of prettily-constructed buildings in which an earnest man and an indefatigable scientist is spending his life in search of the secrets of the universe. The group of buildings compose the seat of a great movement toward the revelation of the unknown—the strange workings of mind and matter, the marvels of psychology, and the whys and wherefores of this curious condition we broadly call life. Here is the Chevy Chase Laboratory nestling snugly amid a small forest of green stuff, and here lives and works Professor Elmer Gates, than whom no one has been more successful in wresting from jealous Dame Nature the treasures of knowledge she has kept unmolested since the world began. Professor Gates is one of your ideal men of science; he plows deep into the hardened furrows of cause and effect his coat-of-arms (should he care for such a bauble) could be nothing more than a great interrogation point, the motto whereof would be, "Know thyself."

Outside the group of buildings at Chevy Chase broods an air of peace and rural repose; inside, the spirit of active research and progress is manifest in more ways than can be told. In a large room filled with lathes, drills, cutting and other machinery, men are engaged in making apparatus to be used in scientific investigation; they are also making models of inventions of great commercial value, for Professor Gates is an inventor of wide experience (although this is but incidental to his main work), one of his recent efforts in this direction being a machine for separating loose ore from sand or disintegrated matter. The latter work is done by means of a magnetic machine,

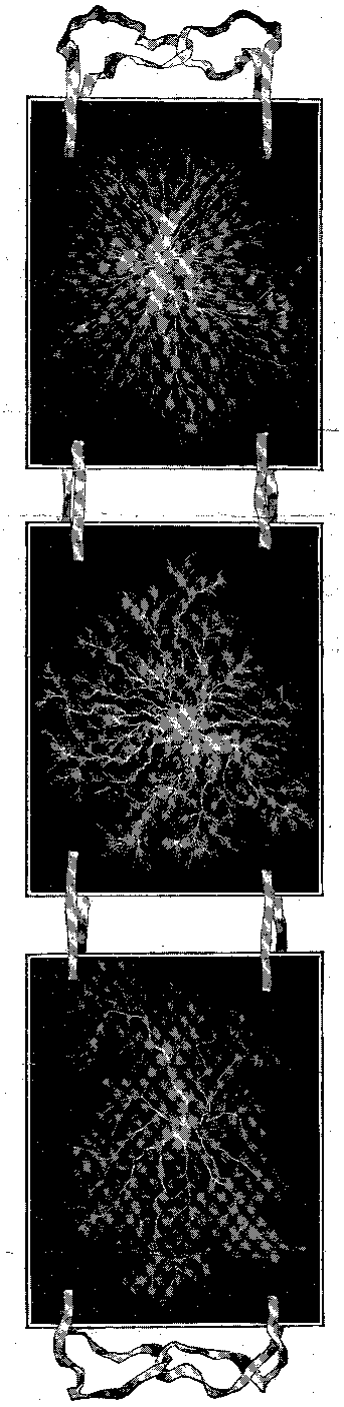
[p. 556]

which attracts the particles of loose ore, allowing the valueless substance to fall by itself. The apparatus is said to be the best of its kind yet invented. One of these machines, costing about [Gates: $180,000] will extract [Gates: iron and gold from 5000 yards daily].

From the machine shop at Chevy Chase one passes to the second story of the laboratory building, entering first the photographic room. Here is seen a great variety of work, embracing ordinary photography of many subjects, X-ray pictures, photo-micrographs, and electrographs. From a scientific point the two latter are the most interesting.

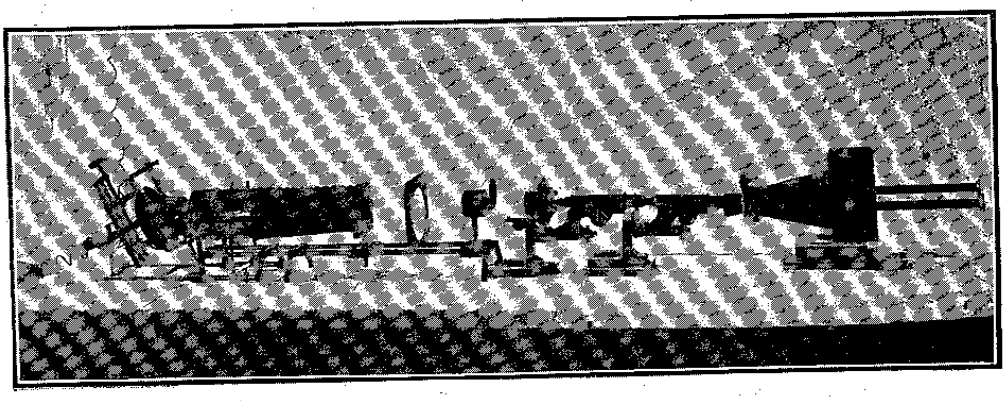
The first of these concerns the mega (double) microscope, invented by Professor Gates. This is an apparatus by means of which microscopic objects are first magnified and then photographed, the whole work being accomplished in one process. The invention successfully does what has often been attempted, namely, to make one microscope further magnify the already magnified image of a first microscope. Others who have tried this have failed for several reasons, one of which, at least, is that the image thus magnified a second time becomes too faint

to be seen; hence, when a second microscope is focused on the already feebly lighted image of a first, the illumination of this second magnification does not appear to the eye, but by mathematically determining the focus the invisible image can be photographed.



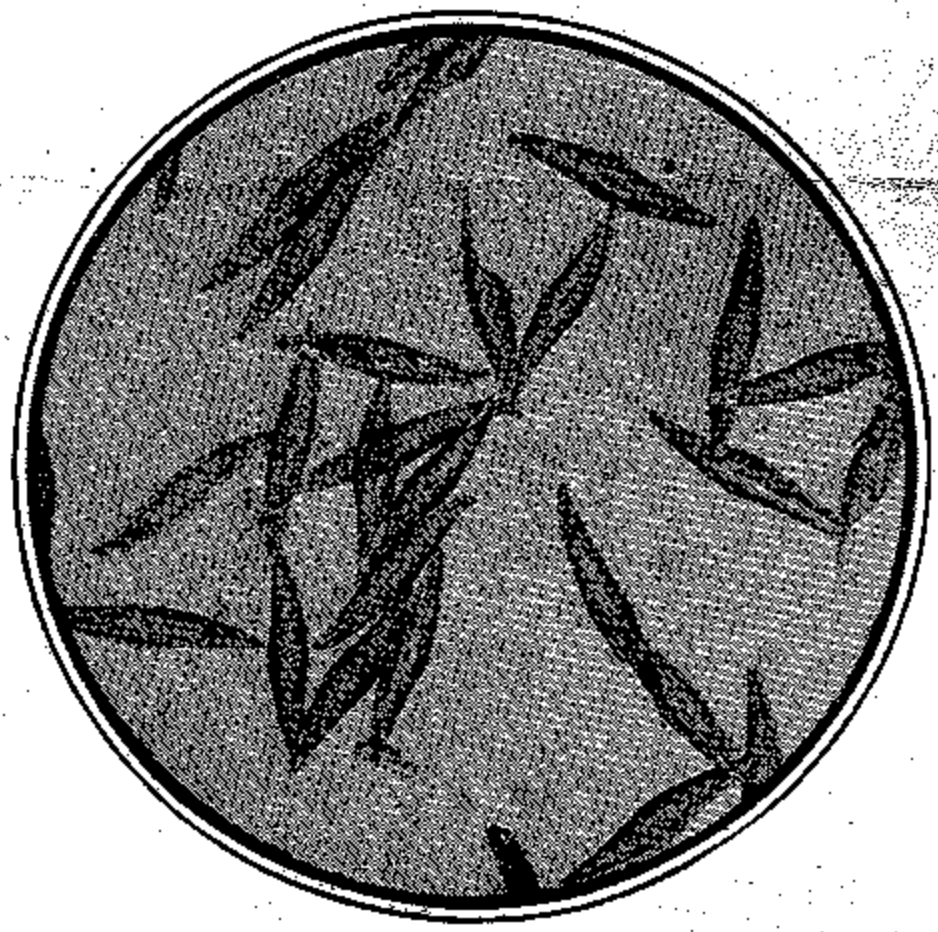
ELECTROGRAPHS—NATURE'S OWN ART WORK.

The apparatus consists mainly of the following make-up: condensing lenses; alum filter with bellows; lenses to render light-rays parallel; a revolving diaphragm at the right (see picture) of the parallelizing lenses; a screen, in which is placed stained gelatin films to screen out undesirable rays; a patented condenser and microscopes and camera.



MEGA (DOUBLE) MICROSCOPE MACHINE.

With the mega-microscope forms invisible to the naked eye can be made to appear so large and distinct that results of the ordinary microscope stand in about the same size ratio to its (the mega's) product as does the midget to a large bird. If a flea were photographed by the double instrument, this lively pest would seem a monster beside which the leaping kangaroo would appear like a mouse. A man thus photographed would present a picture many times higher than the Washington Monument.



PLEURO SIGMA—MAGNIFIED SIX HUNDRED DIAMETERS.

This amazing magnifier is capable of enlarging 360,000 diameters, which means that an object can be thus increased 129,000,000,000 times. Under certain improved

[p. 557]

conditions these stupendous figures can be increased to three and a half million diameters, or over 12,000,000,000,000 times the area possible.

Now, with these figures before us, let us apply the wonderful microscope to the focal plane of a big telescope (Such an experiment is to be made.) We have surmounted all difficulties of diffraction and aberration; have shut out all light rays but the proper kind, and removed all possible cause of jar—as the “magician of Chevy Chase” says must be done before success can be obtained. Now behold the red planet Mars and his little yellow moons—not with the eye, but in the rnicroscope-telescope-camera product. Here, if everything works correctly, we have before us a "detail “in the make-up of Mars. What is it?

A smiling landscape verdure crowned,
Where hills and vales and streams abound,
Where shepherds watch the earth afar
And sing about our little star.

We turn the discovering apparatus to the much vaunted ”canals” of Mars, and there, instead of artificial waterways, we behold the turbid, ancient seas

[p. 558]
that roll in all the majesty of an Atlantic or Pacific.

Thus, the “face” of this planet—one-third the earth’s diameter, and with attendant moons each of less than ten miles diameter—may be gone over, forming a series of pictures that may well surprise and delight the inhabitants of our sphere, and perhaps bring about, some fine day, a means of interplanetary communication.

The making of electrographs, a most interesting discovery, one from which important meteorological results have already been obtained by Professor Gates, shows the erratic nature of electricity and its conduct under certain conditions and also shows many beautiful results—Nature’s art work.

An electrograph is not a photograph, and is not made by aid of a camera. It is the pictured effect of an electric spark from a static machine or an induction coil, acting upon a sensitized plate (put into a light-proof envelope), choosing its paths according to conductivity of the film and potentiality of the current. Various methods are used in thus dispersing the current over the plate, and the resulting size of the picture depends largely upon the length of the spark. Over two hundred experiments in this branch of work have been made at the

[p. 559]
Gates laboratory, in order to study the law of the distribution of electricity and to gather all relative data possible in this connection. If only the first item in this particular were given attention the work would be well worth the trouble.

Professor Gates was not the first scientist to make a picture of an electric spark, but he was the first to make an electrograph and prove that it was not a photograph. Lord Armstrong made the first picture on a sensitive plate from the electric spark, but he did not show that the effect was electro-chemical and not photo-chemical.

Out of the numerous electrographic experiments by Professor Gates many new electrical principles have been demonstrated, and from these researches came the first principles of his meteorological discoveries, which, one great meteorologist has said, constitute an epoch in that science. Professor Gates has demonstrated the fact that when a mass or region of air is electrostatically charged it increases in volume; that is, it becomes less dense and thus causes a low barometer.

These researches will soon be published in a monograph by Professor Gates, and will show the beginning of the meteorological department of his ideal institution.