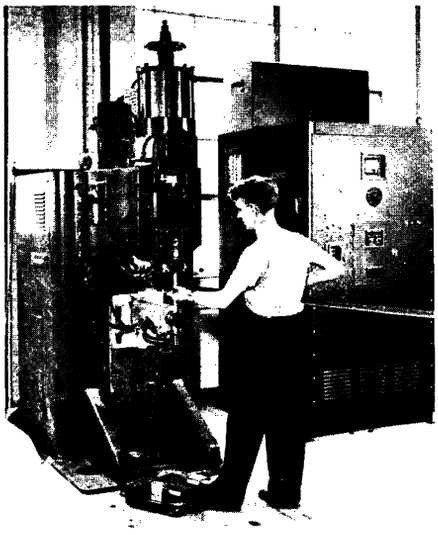

BIG—This resistance welder at RCA Laboratories is one of the largest in the country. It will weld aluminum and has an electronic power supply, which in appearance resembles a radio transmitter.

The dedication ceremonies were held on Sunday (Sept. 27) in order not to interrupt the daily work of both visitors and the laboratories.

Science News Letter, October 10, 1942

PHYSICS

Bump Gives Automobile Seven Kinds of Motion

➤ AN AUTOMOBILE traveling over a bumpy road is subject to seven different kinds of motion in addition to the smooth straightforward one we would all prefer. These are the bounce, pitch and roll, and four kinds of vibration from the wheels. Each has a different frequency. All seven are excited by the passage of one wheel over one bump. Multiply the number of bumps by the number of wheels and you may want to stay at home.

All this was found out by Pierre Ernest Mercier of Electro-Mechanical Research, Inc., of Houston, Texas, after an extensive study of the subject which he reported in the *Journal of Applied Physics*. As a result he finds that independent springing of each wheel is better than springing only the axles. But he has also devised and tested a number of "suspensions" which are superior to any now in use. Perhaps, after the war, our automobiles will roll more smoothly than ever.

Science News Letter, October 10, 1942

ASTRONOMY

Comet Is Not New One

"Discovery" announced by Finnish astronomer turns out to be the famous Schwassmann-Wachmann Comet No. 1, constantly observed for last 15 years.

➤ A NEW comet announced by L. Oterma at the Observatory of the University of Turku, Finland, reported to Harvard Observatory through Lundmark, Sweden, is declared by Harvard astronomers to be none other than the famous Schwassmann-Wachmann Comet No. 1 which has been under constant observation by American astronomers for the past 15 years.

This is not the first time that this comet has been mistaken for a new one. On August 29, 1941, Dr. G. Neujmin of the Simeis Observatory in the Crimea observed it and announced a new comet. But only a few weeks before Prof. G. Van Biesbroeck had observed it at the Yerkes Observatory. This time again it was observed only shortly before being mistaken for new, namely, on Sept. 6 at the McDonald Observatory. Dr. Van Biesbroeck has recently calculated its positions for the last four months of this year.

This comet is one of the most remarkable known. Its orbit is nearly circular, lying wholly between the orbits of Jupiter and Saturn about 500,000,000 miles from the sun—five times the distance of the earth from the sun. From time to time, the comet, for some unknown reason, increases in brightness, although never becoming visible to the unaided eye. It was during one of these flare-ups that it was discovered in 1927 by the two German astronomers whose name it bears. And it was at a flare-up on each occasion that it was mistaken for new.

Because of its nearly circular orbit, the comet is seldom beyond reach of our powerful telescopes and our photographic plates. It descends at times to the 18th magnitude, at other times brightens, as at present, to the 12th magnitude, 250 times as bright. It shows at present a sharp nucleus surrounded by a nebulous envelope. At other times it appears like a faint star.

Science News Letter, October 10, 1942

ASTRONOMY

Only Skin Deep

Bursting forth of a new star is not a deep-seated cataclysm, but a surface explosion. Afterwards the star returns to its retiring normal life.

➤ A TEMPORARY star or nova which suddenly flares up in the heavens without warning and then gradually fades, is not quite the cataclysmal event that some theoretical physicists have supposed. This view was expressed by Dr. Dean B. McLaughlin, professor of astronomy at the University of Michigan and secretary of the American Astronomical Society, speaking before the Rittenhouse Astronomical Society at the Franklin Institute.

The outburst is a surface explosion, Dr. McLaughlin believes, of tremendous proportions to be sure, involving as it does the entire surface, but not necessarily fatal. After "blowing off steam," the star returns to approximately its former state. Its temporary excursion into notoriety produces little change in its normally humdrum life in the heavens.

Dr. McLaughlin's view is based on a personal examination of all spectra of "novae," or new stars gathered at the University of Michigan Observatory and at the other leading observatories of the United States. It is a good idea, he said, for "one set of eyes, with one set of prejudices" to examine all the observational material.

New stars at maximum light, he explained, are about 50,000 times as bright as the sun, though they are so far distant that they appear like ordinary stars. Before outburst they are about the same real brightness as the sun but are smaller, denser and hotter—a type known as sub-dwarfs.

Increase of light from minimum to maximum takes only a few days, but

the decline takes several years. The flare-up must be due to an explosion whose cause is not known. The surface layers expand as a cloud of gas around the star at a speed of hundreds of miles per second. After some months the expelled clouds of gas become visible as a faint nebula around the star.

At the end of the decline the star is apparently not changed from its previous condition, and it must be concluded that all the disturbance is superficial.

Altogether about 90 novae have been recorded in our milky way system, and over 100 have been found in the neighboring spiral nebula Andromeda.

Science News Letter, October 10, 1942

PHARMACY

Atabrine Production Big

Synthetic anti-malarial now produced at rate of half billion tablets per year. Called satisfactory substitute for war-scarce quinine.

➤ ATABRINE, substitute for war-scarce quinine, is now being produced at the rate of about a half billion tablets per year. Actual production totals may fall somewhat short of this estimate, according to authorities. Still there will be plenty of anti-malarial units to treat millions of cases of the deadly, disabling fever.

High speed laboratory machines are spewing tablets of the bright yellow crystals at an ever increasing rate—making bullets to attack malaria to which the armed forces are exposed.

With our men fighting the world round in malaria infested tropics, anti-malarial supplies are of vital importance. The periodic fever is not only a serious disease but could dangerously affect combat strength.

"We have four enemies," one military medical authority declares, "Japan, Germany, Italy—and malaria. There is only one that can lick us. That's malaria. We've got to get results."

Many Army doctors still prefer natural quinine, extracted from cinchona bark, to atabrine synthesized in the laboratory. But our dwindling stockpile of quinine was obtained mainly from Jap held territory in the Far East. Atabrine relieves the shortage.

It should do the job just as effectively as quinine, it is reported by most investigators. There are fewer relapses of cases treated with atabrine, in fact, than when treated with quinine.

Atabrine also compares favorably with quinine in suppression of the disease, clinical reports show. Malarial parasites which hitch-hike from one soldier to another via the mosquito, are eliminated from the blood picture in about a week under either method of treatment.

Only about a fifth as much atabrine as quinine is required for an effective dose. This amounts to about a seventy-second of an ounce of atabrine per day.

More undesirable side reactions are caused by atabrine than with quinine, some physicians believe, but this is probably not frequent or severe enough to be an important factor. Continued administration sometimes also causes a yellow coloration of the skin which disappears after a couple of weeks.

Known chemically as quinacrine hydrochloride, atabrine has been admitted to the new edition of the U. S. Pharmacopoeia, the official book of drugs which will be adopted in November.

Supplies of chemicals to make the medicine are reported as adequate for our needs. And as production goes up, cost goes down. At the present price, it costs the government about as much for atabrine to treat a case of malaria as it does to send an airmail letter, the manufacturer reports.

Quinine treatment costs several times as much.

Atabrine was tested du ing field maneuvers last fall. Results were called very good by Army doctors.

Although gigantic production estimates are unofficially confirmed in reliable quarters, the fact remains that only two companies are in production. Manufacture in this country is based on control of formerly German-owned patents now in the hands of the Alien Property Custodian.

Science News Letter, October 10, 1942

When plans for a *power dam* are drawn up, detailed descriptions of the geology of the proposed site, with data on the character and structure of the rock formations, must be tabulated.

MEDICINE

Hormones Are Concerned With Origin of Cancer

➤ SOMETIMES A WOMAN is afraid she has cancer because she has noticed some change in her breast or has had more or less bleeding than usual each month. These signs might mean cancer, and the wise woman will consult her physician about them at once. The physician may find, however, that the changes are due to change in hormone production.

Hormone disorders are particularly likely to occur in the forties, shortly before the change of life, at an age when tumors are also becoming more common. Hormones also may play a part in causing cancer to develop. To help women understand better the relation between hormones and cancer, Dr. Howard C. Taylor, Jr., of Memorial Hospital, New York, lectured on the subject at the officers training school of the Women's Field Army of the American Society for the Control of Cancer.

"The reproductive organs of women," he explained, "are to a large extent controlled by a special group of chemical substances called hormones. These substances are produced in several of the endocrine glands of the body, those having the most importance being the anterior pituitary gland and the ovary.

"The influence of the hormones is twofold. First of all they lead to the growth and development of the reproductive organs at the time of their adolescence and maintain them in an active state during the years of reproductive life. The hormones are, however, also responsible for the proper functioning of the uterus, the ovaries and the breasts, for the regular recurrence of menstruation and for much that is essential to the normal development of pregnancy.

"The evidence that the hormones are concerned with the origin of tumor growth is quite convincing. In many laboratories it has been possible by the injection of hormones, particularly those of the type formed in the ovary, to produce a great variety of tumors. In guinea pigs fibrous nodules develop in the uterus which are quite similar to the fibroids appearing so commonly in women at about the fortieth year. In mice the ovarian hormones certainly increase the tendency to cancer of the mammary glands.

"For the human being the evidence is not so good, but it has long been known that certain non-malignant