

cycles, and Mr. Ballantine finds that the transmission of a 7,000 or 8,000 cycle band is about all that is technically feasible. Although 7,000 to 8,000 cycles does not give the ear all that it is capable of hearing, reproduction of this frequency range is quite acceptable and the ear does not materially notice the range of sound frequencies that have been omitted. Actually, however, many transmitters are now only feeding a band of 5,500 to 6,000 cycles width into their broadcasting, and this does not give convincing re-creation of sound.

The utilization of wire lines, now made available by the telephone companies, which are capable of 8,000 cycle transmission was urged by Mr. Ballantine. Ordinary wire lines usually impose a limit of about 6,000 cycles.

Serious frequency distortion is caused by many of the microphones now in use in studios and Mr. Ballantine recommended the replacement of all carbon and condenser microphones with the newer crystal and ribbon types. Broadcasting studios should also install for monitoring and audition purposes high fidelity loud speakers. These would allow them to place the microphones within the studios to better effect.

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MEDICINE

Measles Cycle Now at Peak; Many Cases Are Reported

THIS is a measles year. Large numbers of cases are being reported in all parts of the country. For the week ending February 3, the latest for which figures are complete, 21,119 cases were reported to the U. S. Public Health Service by state health officers.

Measles outbreaks seem to run in cycles of about two and one-half or three years, health authorities point out, and this is apparently the peak of the cycle. The cycles are even more noticeable in given areas than nationally.

Parents are cautioned to keep children under three years away from schools, playgrounds and crowds generally, where they may be exposed to the disease, since small children are less able to withstand an attack of measles. Dr. Huntington Williams, Commissioner of Health of Baltimore, has warned families there that the disease is fatal about

PHYSICS

Experiments With Big Guns Give New Sound Speed Value

Dr. Miller's Computation of Data Gathered by Microphones At Sandy Hook Decreases Text Book Figure .87 of Foot

SOUND travels 1087.13 feet per second. This new and highly precise value for the velocity of sound has been computed by Dr. Dayton C. Miller of the Case School of Applied Science, using data obtained as a result of big gun firing at Sandy Hook just after the close of the World War.

Because he has been engaged upon his important ether drift experiments, Dr. Miller did not find time to compute his experiments until recently.

The new value, which is for standard conditions, in free air, at the freezing point (0 degrees Centigrade), is near the mean of values of other experiments, the recognized velocity in textbooks now being 1,088 feet per second. This means that sound travels a little over a fifth of a mile in a second. The old trick of finding the distance of a

lightning flash by counting seconds until thunder is heard, then dividing by five to obtain the distance in miles, is still useful.

An accurately surveyed base of about four miles in length was available to Dr. Miller. The source of sound was the discharge of a large gun at the Sandy Hook Proving Ground. Six listening stations were placed along the course, the first one being about 100 feet from the gun, and the last one four miles away. At each station was a microphone, similar to those used in radio studios. Each microphone was connected by an electric circuit to a recording galvanometer which made a photographic record of the time of the arrival of the sound at the corresponding station. The galvanometer was of the type known as a string galvanometer, which is used in laboratories for various purposes, one such being the recording of the sounds from the heart beats in medical researches.

Meteorological observations for temperature, humidity, barometric pressure, and the velocity and direction of the wind were made at both ends of the course and at two intermediate stations. Seventy-one sets of records were obtained.

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SEISMOLOGY—ENGINEERING

Earthquake Problems Automatically Solved

EARTHQUAKES will have less terror for cities in active seismic regions, as the result of engineering data obtainable with a new device demonstrated at the Massachusetts Institute of Technology. It is known as a stress recorder, and is the invention of A. C. Ruge, research associate in seismology in the department of civil engineering.

The stress recorder consists basically in a train of lenses and reflecting prisms, which pick up a slender beam of light and pass it on to a sheet of photographic

forty times as often to children between 6 and 18 months as to children of school age.

When a child has measles it is particularly important to keep him in bed so that he will be protected from cold and chilling.

Control of measles epidemics is made difficult, however, by the extremely contagious nature of the disease and by the fact that symptoms are not obvious until some days after the contagious stages have set in.

The wisest procedure at the present time during a measles epidemic is to have a daily medical inspection of all school children, because in the majority of cases a skilled physician can detect the disease in the pre-eruptive stages. A child so affected should be sent home to bed.

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paper mounted on a slowly rotating drum. So long as the system is at rest the pencil of light writes a straight line on the paper. But when a stress bends or displaces the support of one of the reflectors, the beam of light is correspondingly displaced, so that the line traced on the photographic paper becomes a curve, accurately recording the degree of bending and hence the force exerted at that point. A timing device, which splits time up into thousandths of a second, makes its record on the same sheet of paper.

The optical parts of the stress recorder total less than an ounce in weight, and models of the essential structural units of a steel building can be kept down to a few feet in height and a weight of a hundred pounds, so that the entire arrangement can easily be mounted on a "shaking table" which will simulate under laboratory conditions any type of earthquake whose effects on structure it is desired to study.

The stress recorder constitutes a simple mechanical shortcut to results previously obtainable only by the most tedious and long-drawn-out kind of labor with slide-rule and calculating machine; and some of the results obtainable with it represent the integration of forces so complex that their mathematical calculation by ordinary means is not possible at all.

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Specialization is nothing new in industry: Roman writers tell of workmen who made only parts of statues, or certain garments for the clothing trade.

MEDICAL ECONOMICS

Medical Service Regarded As Social Necessity

State Medicine Seen Unless Doctor's Service is Socialized; Physicians Badly Distributed in Cities as Well as in Country

"A REFUSAL to socialize medical service is to ride directly into the storm of state medicine."

This terse statement of the probable "violent reaction" of the public to the "entrenched stubbornness" of some of the leaders of the medical profession was made by Dr. James H. S. Bossard, professor of sociology at the University of Pennsylvania. Dr. Bossard opened a conference on the medical profession and the public held in Philadelphia under the joint auspices of the College of Physicians of Philadelphia and the American Academy of Political and Social Science.

The public has come to regard health and adequate medical service as a social necessity and even as a social right along with protection against criminals and the guarantee of property rights, Dr. Bossard pointed out. This has resulted from the health service given to children in schools, to the fighting forces during the World War, to the war veterans and industrial employees.

Whether this new attitude toward health and medical service is right and

justified, Dr. Bossard refused to say. However, it must be faced as a fact, he declared.

The part the medical profession has played in giving adequate service, often without any remuneration, and in developing methods of protecting the health of individuals and communities alike was not minimized by Dr. Bossard. He merely pointed out that the new attitude exists and conflicts with the interests and conceptions of many private physicians.

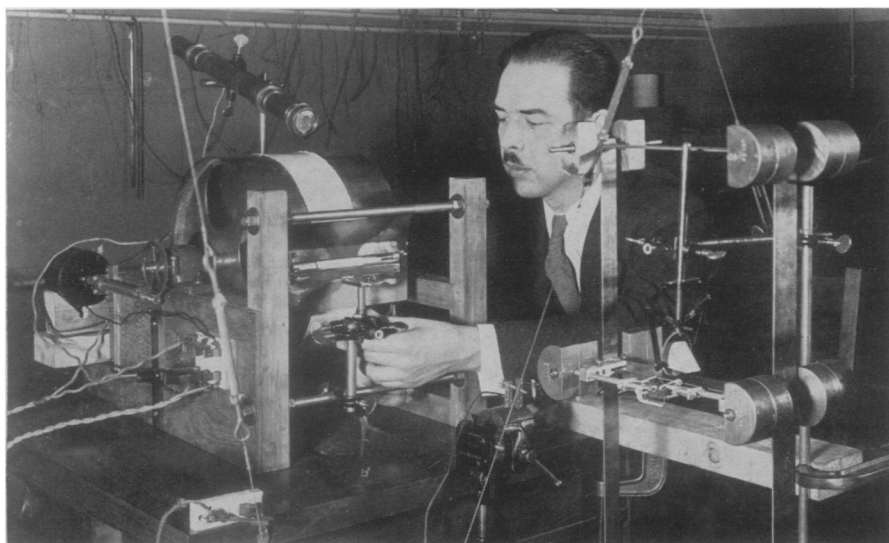
Another factor in the conflict which particularly strikes the sociologist as he looks at the doctor is the spatial distribution of physicians' services. Not only is there a dearth of doctors in the rural areas, but even in cities they are badly distributed among the population. For example, in Philadelphia one-fourth of the doctors have their offices in the down-town and business sections. This gives a ratio of one doctor's office to every 29 persons.

In outlying, more thickly populated sections the doctors are fewer. In South Philadelphia, where one finds nearly one-fifth of the city's population, there is one doctor's office for every 1,166 inhabitants. In Kensington and Frankford, containing over a fifth of the population, there is one doctor's office for every 1,216 inhabitants, and in southwest Philadelphia, there is one office for every 1,910 persons.

"Socially speaking, medical service is most needed in poorer areas; professionally, it is natural and inevitable for doctors to follow their paying patients," Dr. Bossard observed.

One result of this, however, has been the growth of free and part-pay clinics in hospitals. Hospitals cannot move as readily as physicians can move their offices. Left behind in the poorer and congested areas, the hospitals have organized medical services for their neighborhoods. This has led to conflict between hospitals as health centers and interests of privately practising physicians.

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LABORATORY EARTHQUAKES SHAKE MODEL

Mr. Ruge is adjusting his stress recorder which measures stresses in models of building frames as they are shaken artificially. The two uprights with half-round weights represent the frame.