

Heroes of Science

By G. B. SEYBOLD.

"Three or four more days and I'll be delivered."

Professor Emile Bergonie, a French pioneer in radium research, was dying. For nearly two months he lingered, each day adding more atrocious pain. Partly numbed with opiates, he called medical workers to him daily, gave them conclusions drawn from his sufferings, and suggestions of how to go on with radium research. He even planned in minute detail an autopsy to be performed on his body after death.

Working for many years with X-rays in the treatment of cancer, the deadly weapon had turned upon him and burns led to his contracting cancer himself.

Three years before his death his right arm was amputated. He continued his work. Then three fingers of his left hand were removed.

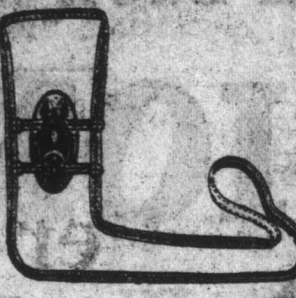
Behind him lay a record of distinction. For two inventions alone he could claim the gratitude of humanity—an electric vibrator used in the treatment of shell-shocked patients and a magnet for withdrawing bullets and fragments of steel from wounds.

By the eradication of cancer, he felt was his life work, and only death should stop him. Racked with pain, he fought for three long years. As he lay on his deathbed, France pinned upon him the Grand Cross of the Legion of Honor. He died, known and acclaimed as one of her greatest heroes.

Another brave and famous Frenchman, Dr. Charles Vallant, of La Reboisiere Hospital, Paris, recently was the center of poignant ceremony at the Hotel de Ville. France conferred on him the Cravat of the Legion of Honor; Paris, his own city, the Gold Medal, both extremely rare honors, and Ambassador Herrick, for the United States, presented the Carnegie Medal for Heroism. With both arms gone, sacrificed in X-ray research, this very real hero stood erect and undaunted by misfortune before the assembly that had gathered to do him honor.

At Johns Hopkins Hospital in Baltimore the other day Dr. Frederick Henry Baetjer underwent his seventy-first operation. The ordeal left him with only two fingers on his hands. One by one, the other eight had gone as a result of ulcers developed from X-ray burns. He lost an eye from the same cause. After the operation, the

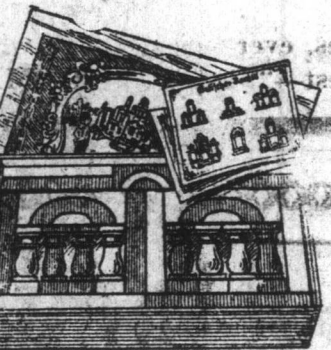
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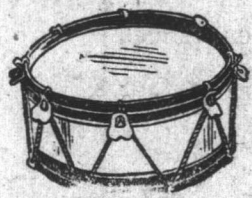
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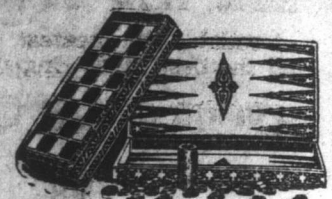
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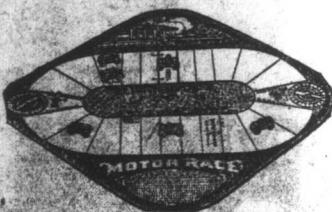
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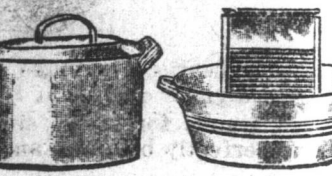
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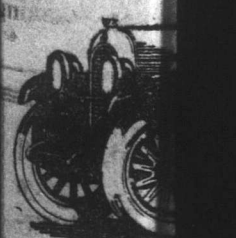
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FRESH EGGS.

brave man said: "I suppose my re-
 searches will eventually kill me, but
 I'll die with my boots on."

The hope that has come to thou-
 sands suffering from cancer through
 results of experiments with radium
 has meant the sacrifice of nearly 150
 scientists; more than a score in the
 present century. Behind practically
 every important medical discovery
 there is a list of crusaders who risked
 all even their lives, to establish its
 truth.

Doctor Marcell C. Hall, of the U.S.
 Department of Agriculture, was try-
 ing to find a remedy for hookworm
 disease. Working with animals, he
 found that the parasite that car-
 ried the disease, a substance chemi-
 cally similar to chloroform, and used
 as a remedy of roots and used
 from clothing, removed all
 traces of hookworm in dogs. He tried
 it on rabbits, but the rabbits died.

What effect would it have on human
 beings? The only way to find out was
 through experiment. He measured out
 three cubic centimeters of the chemi-
 cal that might mean instant death.
 He swallowed it. Through his heroism
 he discovered a remedy for a
 disease that had been the scourge of
 the East for centuries.

One of the most thrilling examples
 of scientific heroism ever shown was
 that of a band of men who risked
 their lives to conquer yellow fever.
 This terrible disease used to ravage
 America year after year, taking thou-
 sands of victims. In a single epidemic
 Philadelphia lost one-tenth of its en-
 tire population. At the close of the
 Spanish War, while American troops
 were still garrisoned at Havana, the
 dreaded plague appeared there.

The United States Government ap-
 pointed a Yellow Fever Commission,
 formed of Doctor Walter Reed, Jas.
 Carroll, Jesse Lazear, and a Cuban
 member, Dr. Aristide Agramante. The
 great achievement of this commis-
 sion—unparalleled in the history of
 medicine—was proving that yellow
 fever was propagated by the mosquito.

Doctors Lazear and Carroll delib-
 erately permitted themselves to be
 bitten by mosquitoes that 12 days be-
 fore had filled themselves with the
 blood of yellow-fever patients. Doctor
 Carroll was stricken at once. For days
 he lay in violent delirium. Doctor
 Lazear treated him and he finally re-
 covered.

Doctor Lazear was not affected, but
 some time later, while working in a
 yellow-fever ward, he was bitten
 again by a mosquito. He saw it light
 upon him, and convinced that it was

a carrier of the fever, permitted it to
 bite. This time he acquired the disease
 in its most terrible form. Before he
 died he handed his notes over to Doc-
 tor Carroll with instructions: for
 carrying on the work.

To test the spread of the disease, a
 completely mosquito-proof building
 was divided into two compartments
 by a wire screen. Infected mosquitoes
 were put on one side. John J. Moran,
 a private, volunteered to enter the
 side containing mosquitoes. He was
 bitten and came down with the dis-
 ease. Two susceptible men on the
 other side of the screen, remained in
 the house 18 night, almost within
 arm's reach of the sick man, without
 contracting the disease.

Again, Robert P. Cooke and two
 men from the Medical Corps slept 29
 nights in stifling heat, surrounded by
 clothing and bedding of men who had
 died of yellow fever. None got a
 symptom of the disease. Afterward,
 to prove that they were not immu-
 ne, they exposed themselves to mosqui-
 to bites and were infected.

At last it had been proved that the
 mosquito alone was the cause of yel-
 low fever! Yellow fever as a nation-
 wide plague was conquered!

Hidden in reports of State Boards
 of Health may be found many chap-
 ters of heroism. One of these, that of
 the Montana Board for last year, re-
 cords the death of four men who were
 investigating Rocky Mountain spotted

fever. This fever was widely spread
 over nine states, with mortality, in
 some places as high as 75 per cent.
 Dr. Howard Taylor Ricketts, believed
 that the fever was conveyed by the
 bite of a tick from an infected ani-
 mal. Dr. T. R. McClintock, Dr. Arthur
 McCraw, W. E. Gettlinger, and Henry
 Cowan all contracted the disease
 while working with it and died.

Doctor Ricketts' theory was proved.
 He, fortunately, escaped with his
 health unimpaired. Next he began in-
 vestigating typhus fever. This disease
 is prevalent under unsanitary condi-
 tions. There were but few cases in the
 United States, so Ricketts and a col-
 league went to the City of Mexico and
 worked with fever victims. There they

established that typhus is communi-
 cated by the body louse. For this in-
 formation, which meant the saving of
 thousands of lives, Ricketts gave his
 own life.

In Yerkes Observatory in Wiscon-
 sin, a sacrifice has been made of which
 few know. There, the director, the
 distinguished Prof. Edwin Brant
 Frost, has literally given his eye-
 sight to the stars. For many years his
 eyes have been ailing from delicate
 work with telescopes and microscopes.
 But he would not give up his work.
 One night the retina of the left eye
 was torn loose and the most skilled
 oculists in the world have given up
 hope of ever restoring sight to it. A
 cataract grew over the other eye un-
 til it covered it almost completely.

A crate arrived in Washington, D.
 C. one day last year, filled with dan-
 ger. It contained a live rabbit afflicted
 with tularemia, a disease that human
 beings contract from handling rab-
 bits infected with it. In the Western
 states this disease menaced both hun-
 ters and those who bought dressed
 rabbits in markets. The organism
 causes a disease the symptoms of
 which in human beings are similar to
 that of typhoid fever.

The Government of Public Health
 Service undertook to find out more
 about the disease in order to protect
 the public against it. The doctor who
 began the investigation soon contracted
 the disease and was replaced by
 another. Five times this was repeated.
 The startling rapidity with which the
 experiments claimed victims, instead
 of discouraging those in the research,
 inspired their zeal and the work still
 goes on.

The World War added scores of
 names to the long list of lives sacri-
 ficed to science in the present cen-
 tury. One of these was Col. E. F. Har-
 rison, who risked death by poisoning
 time after time to learn how the At-
 tled troops might be equipped to with-

stand the German gases. Eventually
 his lungs became so impregnated with
 poison that when influenza seized him,
 he had no resistance and died.

Shortly before the Armistice, a new
 explosive, tetra-nitro-cubane, more deadly
 than TNT, was being developed, for
 the army in a government chemical
 laboratory in New York. The work-
 men manufacturing it were overcome
 with a mysterious malady. Physicians
 declared that poison in the gas pass-
 ing through the skin destroyed the
 red corpuscles in the blood. Protec-
 tion with gloves and clothing was
 useless.

Four chemists volunteered to make
 a series of tests. The first collapsed
 after working four days. He was a de-
 cided blond. The second, who was
 slightly darker, lasted seven days.
 The third, a pronounced brunette,
 managed to stay 12 days before keel-
 ing over. The fourth, a swarthy Ori-
 ental, worked two weeks, suffering
 much less from the chemicals.

They had proved by risking their
 lives that the gas could be made safely
 by those with heavily pigmented skin.
 Two weeks later the plant was man-
 aged by colored workers.

Two of the great heroes of the war
 died, not on the battlefield, but in so-
 called hospitals in Serbia. The epi-
 demic of typhus that occurred in
 Serbia in 1915 was one of the most se-
 vere the modern world has known.

Doctor F. Donnelly, of the American
 Red Cross, was at the head of a hos-
 pital at Ghevgheli. This was an old to-
 bacco factory in a barren, uncultivated
 country, into which 1400 persons were
 crowded. The water was infected,
 what clothes the patients had were
 swarming with vermin, the dead lay
 unburied. Working day and night un-
 der these appalling conditions, Doctor
 Donnelly's health finally gave way and
 he died. Doctor Ernest P. Macruder,
 in another hospital, worn out by over-
 work, also succumbed. Three other
 physicians gave their lives in Serbia.
 The list still grows. In hundreds of
 laboratories and hospitals men are
 working to-day to prove facts about
 disease, facts that eventually will
 mean larger protection for you and
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