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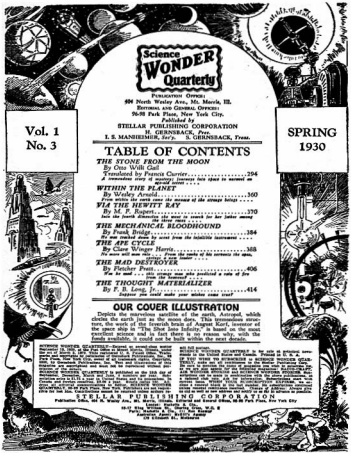
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Depicts the marvelous satellite of the earth, Astropod, which circles the earth just as the moon does. This tremendous structure, the work of the feverish brain of August Korf, inventor of the space ship in "The Shot Into Infinity," is based on the most excellent science and in fact there is no reason why, with the funds available, it could not be built within the next decade.

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# The MECHANICAL By Frank Bridge BLOODHOUND



(Illustration by Zuger)  
He took his place at the scotoscope and trained it on the tube. Then he looked through  
the binocular eyepiece.

"GOOD morning, Professor Diei—how's the olfactory eye, or the optical nose, or whatever you call it, coming along?"

At these words the savant glanced up from a beaker.

"Oh! Good morning, boys, good morning! Why—the scintoscope is coming along tolerably fair, thank you!" He nodded pleasantly to Becker and me. My young friend indicated me with a wave of his hand.

"You remember Bridge, don't you, Professor? He's the chap who sent the story of your penetrating ray to that eastern publishing company."

"Certainly I recall Mr. Bridge," responded the scientist, and motioned us to be seated in a couple of strong chairs before the long table at which he was employed. Soon he set aside the beaker and advanced toward us, drawing up a third chair, into which he dropped wearily.

"It's this way, Professor," commented Becker in answer to our host's inquiring glance. "I've been trying to give Bridge here the rudiments of this scintoscope you're working on, but I don't seem to have succeeded very well. Suppose you give him the intimate dirt."

The grey-haired sage smiled as he turned to me.

"Doesn't modern youth have odd expressions of speech, Mr. Bridge? Fancy my handing you dirt!"

"You seem to regard me as an old-timer, Professor," I grinned back, "despite the fact that I'm no older than Ned here."

"Yes, well — somehow you *are* an old-timer, even if you are young. But I suppose you're wondering what this scintoscope business is all about?"

I confessed to my curiosity.

"Well, briefly, it's this: my recent lectures at the university have had to do with scent; and since I had nothing better to do during my spare hours here at my cottage, I undertook a few researches of my own on the subject.

"Starting with the assumption of some scientists that scent is the result of an etheric vibration akin to electricity and light, I set about to investigate this theory; for in my own opinion scent needed a gaseous source in every case. First off, I went down to Calhoun—ever been there?—the smelliest town in the country. What with stockyards, packing houses, tanneries, fertilizer factories, chemical works, soap factories, glue-factories, tar-product plants, and a garbage-dump of prodigious extent, you can readily see that Calhoun is an ideal place to conduct a study of the science of smell.

"My presumption that smell cannot exist except as

the result of a gas is borne out by the fact that wind will deflect a scent toward that direction in which the wind moves. You are, of course, familiar with the fact that varying atmospheric conditions create correspondingly different conditions in the intensity and other qualities of an odor. Hence it is quite apparent that a gaseous element is essential to the existence of an odor.

### The Professor's Theory

"THAT brought me down to two possibilities. The question to be decided was: is scent a vibration in a gas, like sound, or is it a stream of gaseous particles ejected from the odorous object? If the former, evidently the frequencies of the vibrations were either above 20,000 per second, or below 16 per second, because obviously odors are imperceptible to our ears.\* Furthermore some animals, that apparently have a greater range of sounds that can be interpreted by their ears, employ their noses for the purpose of determining odors. So that cut out the former hypothesis and left only the idea that an odor is of gaseous constitution.

"Several cases tend to corroborate this theory. First, the nose, the principal purpose of which is to supply one's lungs with oxygen to support life, is the organ which detects odor. Secondly, scent is so easily directed by the passage of a moving gas that its own gaseous source is clearly indicated. Thirdly, holding one's breath quite effectually stops all sensation

of smell, which would not be the case if scent were some sort of vibration affecting a delicate membrane in the nose. And finally, by way of experiment, I placed several decaying fruits in a glass vessel which I then evacuated of all air. If the highly offensive odor which the fruits emitted were gaseous in constitution, I told myself, the gas would gradually fill the glass vessel. So I heated the bottom of the jar in order to make the gas float upward, and cooled the top to make the gas condense on its inner surface; and sure enough, in a little while a very thin film was apparent all over the under side of the jar's lid, showing that some form of vapor had condensed there.

"Now here is where the scintoscope comes in. I haven't fully perfected the instrument yet, but, briefly, its purpose is to determine the different scents given off

\* 16-20,000 vibrations of the air per second represents the range within which our ears detect sound.



FRANK BRIDGE

WE are accustomed to think of our noses as the only means of detecting a scent or odor; but in truth our organ of smell is only a rather poor instrument that nature has given us. We humans, especially, have not a very sensitive means to determine smell. In fact, the lower animals are greatly superior to us in this respect. Many experimenters have worked on the question of finding a substance which is automatically sensitive to odors, and by which the differences of various odors can be detected. If such a thing were to be found, it would be like a mechanical bloodhound. In other words, it could be used to easily trace criminals by their characteristic odor, a thing which they cannot disguise. How such an instrument could be used in an actual case our author shows in a very fascinating story.

by different substances, plants, and animals. Because the human nose is not sensitive enough, some method must be found that will enable us to determine scent by other means—by an optical means, preferably. Of course, the spectroscope\* showed the odorous vapor in the glass jar to be composed of the atmospheric gases with a very high carbon content, and evidently in some unusual form of atomic or molecular structure. Now the scentoscope is a sort of combination between the spectroscope, the Michelson interferometer,† and the fluoroscope.

While he was speaking, the professor had brought a camera-like apparatus from one corner of the laboratory. In the front was a two-inch lens, with a small lamp mounted over it, facing outward, and a binocular eyepiece was in the back of the box. Several dials were on each side of the cube, and the whole device was mounted on a tripod.

#### What the Machine Revealed

"THIS is an ordinary mercury-arc lamp," explained the professor, indicating the small projector above the lens, "generating ultra-violet rays which illuminate the space before the scentoscope. I use ultra-violet rays, of course, because they can be intercepted by air molecules and therefore can show a moving vapor—which is the odor to be analyzed. The lens is crystalline quartz. Behind the lens, inside this box, is a quartz plate treated with a fluorescent liquid which glows violet upon impact of the ultra-violet rays. Now, due to the difference in molecular structure between ordinary air and any form of odorous gas, there is a difference in the color or the shade of the ultra-violet rays reflected or refracted by the two gases. This makes the odorous gas visible on the quartz plate.

"In order to facilitate study of the latter I have a rather complicated interferometer behind the quartz plate which cuts out the shade or color reflected by the air molecules, thereby leaving only that particular shade of light which is reflected by the scent-particles.

"Behind this is a quartz prism as in a spectroscope, which enables me to determine the chemical constitution of the odorous gas. It is this last feature that still needs developing, for I wish to improve it so that I can tell whether an odor belongs to a horse or a dog or a man, even though I do not see the animal. If it is man, for instance, I also hope to determine the race and sex—whether white, yellow, black, red, or brown; male or female; and—yes, perhaps even the approximate age! That, Mr. Bridge, is the scent detector, or the optical nose, that Ned has been speaking of."

Of course, my curiosity prompted me to peer through the instrument, but beyond seeing the laboratory wall with its rows of jars and test-tubes through a slightly violet-tinted aperture, the experience netted me nothing.

"How is it adjusted, Professor?" I inquired.

The savant advanced, took my place at the eyepiece of the scentoscope, and trained it on a beaker in which he then poured a chemical solution with a most unpleasant odor. Then he snapped on the arc-lamp above the lens of the scentoscope, and looked through the binocular eyepiece. When he had properly focused it he stationed me to the instrument.

As I looked through it, I saw a black pedestal upon which stood a black beaker, and from the top of this

\* An instrument for analyzing light waves.

† An instrument for analyzing the spectra of incandescent gases.

receptacle rose a wavering line of indigo vapor, while all around it was a field of faintest violet.

"The vapor, Professor, is the stench from that beaker, eh?"

"Absolutely, Mr. Bridge!"

Becker took the instrument after me, and when he had finished with it, the scientist again placed his eyes to the binoculars. This time he slowly turned the first of the dials on both sides of the apparatus, and finally looked up once more.

I assumed the eyepiece again, to be greeted with the same sight as before, except that four vertical black lines traversed the violet field at regular intervals of about one inch each.

"Those are interference-bands," I heard the sage remark, referring to the vertical stripes upon which I gazed, "formed by the first of four pairs of mirrors within the scentoscope. The bands are made by altering the distance between the mirrors, as in the Michelson interferometer."

After Becker had had his look the professor manipulated the second set of dials, and this time as I employed the instrument I counted twenty interference-fringes running vertically through the violet field. The violet bars were of about the same width as the black ones, and, if I recall aright, were twenty-two in number.

"As before, Becker followed me to the scentoscope, and then the instrument's inventor twisted the third pair of dials. And my vision as I took my place at the eyepiece, was greeted now with a black field broken only by four violet bars and the wavering indigo wisp of scent. Evidently the interference of the violet rays had been so developed that almost complete darkness took their place. And by the time the fourth set of mirrors had been arranged by the professor, only the indigo vapor curled and floated upward in a field of black velvet.

Now the professor shoved in a prism that had been protruding from one side of the scentoscope, and as I again looked into the instrument I saw a series of fine vertical black bands traversing an indigo field of varying shade. These, however, I knew to be spectral lines instead of interference-bars, but being unfamiliar with ultra-violet spectroscopy I was unable to identify the elements which they represented. The professor observed, however, that the vapor was composed of oxygen, carbon, and hydrogen.

Of course, I expressed my interest and enthusiasm, congratulated the professor upon the success thus far attained, and tendered my best wishes for an early and completely successful termination of his investigations. Then, after chatting with the scientist for a while, Becker and I took our departure.

#### A Strange Case

A WEEK later I once more entered the laboratory. "Hello, Bridge," greeted Becker, while the scientist nodded to me and called a cheery "Good afternoon!"

"Professor," I began as I seated myself in the chair that Becker proffered, "could I enlist your aid for the sake of a friend of mine? You remember Jack Barton, don't you, Ned?" I asked, turning to Becker. He nodded.

"Well," I continued, "for the past week he's been getting all manner of threatening phone calls from some man whom he can't place, demanding that he get out of town before the seventeenth of this month, if

He doesn't want something unpleasant to happen. As I recall, Jack got the first call seven days ago—on the sixth—and this man, whoever he is, told him to beat it before ten days had passed. The next day this chap cut it down to nine days; the day following to eight days; and so on till today he gave Barton just three days' time to clear out or have something terrible happen to him.

"First Jack passed it off as a joke of some sort; but this afternoon he was nearly hit by a big brick that came down from the roof of his office building as he went out to lunch; and later in the afternoon he got his daily call from the stranger. Today the fellow also stated that next time it wouldn't be a brick and, furthermore, next time he wouldn't miss.

"Well, Jack had the call traced to a pay-station at the Arcade. I've just come from there—trying to find something, you know—but it was useless. So I wonder if you couldn't sweep around a bit tomorrow afternoon between three-thirty and four—that's when the calls usually come in—with your Cosmic Ray apparatus and try to spot the enterprising individual who's behind this brick-hurling racket."

Professor Diel rubbed his chin in silence. Then he slowly shook his head. "I'm afraid it won't work, my young friend. The instrument is built against the west wall of the laboratory, and so it has a very narrow range of action. Besides, even if we could employ the beam in an easterly direction, we have no means of knowing which person is phoning to your friend from among the scores we would find in booths. My instrument doesn't carry sound, you know."

I heard Becker swear softly as he realized the truth of the avant's statement.

"Have you any conception of this mysterious person's motive in threatening Mr. Barton in this manner?" the professor asked me.

"Well, I'm no detective." I responded, "but it doesn't take much imagination to supply a possible motive. Barton is engaged to Alice Smedley—remember her, Ned?"

"Sure," grinned Becker, "Old flame of yours, isn't she?"

I smiled as I shook my head. "No. Been in love only twice. First one was Ethel Kent—you don't know her—and the second one I won't mention. Last 'uns both, so now I'm a confirmed woman hater."

"But this—" prompted the professor, referring to the cause of my visit.

"Oh!" I resumed, "Well, the wedding is to take place on the seventeenth—the day on which Barton is supposed to be absent if he wishes to avoid unpleasant consequences. So you see, there's nothing so mysterious about it. Just the case of a jilted rival who intends to let no one else have Miss Smedley if he can't. I've spoken to her on the matter, but since there were several beaux, old and young, who were disappointed, she can't shed any light on the subject, either."

"Do you think you can bring Mr. Barton and his brick over here, Mr. Bridge?" demanded the professor.

"Sure!"

"Then do so at the earliest possible moment. And caution him to tell the police nothing. If they get that brick into their hands all our evidence is gone!"

Ten minutes later I ushered Barton and the brick into the professor's laboratory. After the introductions, Barton briefly related the story of the phone calls and the incident of the brick. So far he had said nothing to the police.

When Barton had finished, the professor placed the brick on a pedestal, and somewhat to my curiosity brought out the scentscope and a camera. The former he trained on the brick and rapidly commenced his elimination of violet light.

"The scentscope has at last been perfected, Mr. Bridge," he announced, "By replacing that original prism by another one of somewhat more complex shape, I have at last been able to determine the makers of various scents. In my experiments I have used Becker, a Chinaman, a Negro, an Indian, and a Polynesian; I have used both men and women, and in each case the particular odor emitted by the subject was somewhat different from that of the preceding individual. In short, it is possible to determine not only species, but also race, sex, and individual by the scentscope; and further—it is even possible to discover the individual's approximate age, as well as the approximate age of the odor clinging to any object handled by him!"

#### The Man Discovered

BARTON and I gaped.

"Two sets of odor emanations are quite apparent," the professor mused as he looked into the scentscope. Then, turning away from it, he permitted the rest of us to look. Again all I saw was a compact series of fine black lines set against a pale indigo background. But evidently this new prism merely revealed the molecular structure of the odorous gas clinging to the brick, while a regular spectroscopic prism showed its chemical constitution.

When we had all had our chance, the professor took several photographs of the odor emanation lines while Becker and I explained the instrument and its purpose to our exceedingly interested friend.

"Now, Mr. Barton, will you kindly sit down in that chair and permit me to photograph the particular odor emanation which is your own? I need it in order to determine which of those lines we just saw belong to the person who has been threatening you lately."

Barton complied, and fifteen minutes later we three youngsters departed, leaving Professor Diel to develop his photographs.

The next afternoon found the professor, Becker, and myself in a seldom-used telephone-booth at the outskirts of the town, whither Barton had traced the day's threat, and here the scientist took several pictures of the booth and the phone through the scentscope. With these we returned to the laboratory.

"Suppose you boys dig up Barton and have dinner with me tonight?" suggested the professor as we left him at his cottage. "I think that after seven o'clock, I'll be able to tell a little about Barton's annoyner. We dine at seven," he concluded, and turned into his dwelling.

Accepting his invitation, we three young men found ourselves in his cottage at the designated time, and after dinner he gave us his results.

"The strongest odor emanation lines in the photographs taken at the booth," he commenced, "agree perfectly with those left on the brick after I had eliminated those of Mr. Barton. The possessor of this particular odor is a white man of middle age, possibly somewhat corpulent, and is employed in the office of a camphor factory. He uses Palmolive shaving cream, Mennen's talcum powder, and is a careful dresser. He wears kid gloves, perfumes himself rather more than necessary, and wears a carnation in his coat-lapel. Do you know anyone with these general features who once paid court to Miss Smedley, Mr. Barton?"

(Continued on Page 421)

## The Mechanical Bloodhound

(Continued from page 387)

Turning to Barton I saw his jaw clamped and his eyes shining queerly.

"Yes," he said slowly, "I know a man like that—but I didn't know he had an eye on Alice. I've heard a lot of unsavory rumors about him too, but I've always attributed them to nothing more than the gossip of a lot of busybodies. But show me how to handle this scentoscope of yours, and lend it to me with a camera, and I'll show you the person himself tomorrow night. I promise I'll take good care of the outfit," he concluded, turning to Professor Dietl.

It was easily arranged and, as we drove off together, Barton had the desired instruments in his car.

The next evening we again congregated at the professor's cottage. Barton had brought the instruments back with him, also a set of negatives which the scientist at once began to develop.

"Get your daily call, Jack?" asked Becker.

"Yes. Tomorrow afternoon by four o'clock I hit the trail into the hereafter unless I light out before that—alone."

"Going to do it?" I inquired.

"Not by a darn sight!" Barton flared up, "Now that I know who he is, he can't scare me! By tomorrow noon he'll be in the coop anyway," he grinned.

Becker and I essayed to learn the culprit's identity, but Barton refused to enlighten us, saying we could wait until Professor Dietl had finished the pictures. And before we left that evening they were ready. Three of the plates showed odor emanation lines which the savant declared identical with those he had previously decided as belonging to Barton's unknown assailant, and the fourth showed the man himself—a stout, self-sufficient man of middle age, black-haired and with an expression of oily, smug satisfaction on his rotund counte-

nance. A black coat garbed him, and a red carnation was stuck in his left lapel.

"Who is it?" I asked again.

Barton grinned. "My boss—old Severson," he remarked easily.

"Your boss!"

"Sure. I work in a camphor plant, don't I? And he leaves the office every day at noon—plenty of time to send those calls while I'm still in the office. Works on the other side of my desk. Never did like him very much, and they say he's not only a bootlegger, confidence-man, and dope-importer, but some things even worse. He can easily run two or three businesses, you know. These photos were a cinch. Got to the office before he did, took a scentoscope picture of his chair, his side of the desk, and one of him by putting the outfit in the open safe behind him. When I went to get a drink of water I just pulled away the book in front of the outfit and snapped him. Nothing to it. The other photo I found in his desk. Always keeps a batch on hand for any of his lady-friends that drop in. Think you can fix it so that he won't bump me off before tomorrow afternoon, Professor?"

"Certainly, the proper steps will be taken," the scientist assured Barton, "I will attend to the rest tonight. Good night, boys! Sleep tight!"

The next morning Mr. Severson was placed under arrest on the evidence of Professor Dietl, and though he vigorously denied having any such evil intentions toward Barton, he was detained until after the wedding of Barton and Alice Smedley. His trial will come up in several weeks, and although the evidence to be presented will be new to the court, I do not doubt that the high reputation of Professor Dietl will substantiate the meek tale of the scentoscope.

THE END.