

The Labs of the Invisible Man

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Now you see him, now you don't. In THE INVISIBLE MAN film series (1933-1944) from Universal Studios the contrivance that drives the plot that makes the Invisible Man invisible is a substance called, "monocane". To extract and test a substance like monocane, a compound from a plant, would require some sophisticated lab apparatus. In this article we will examine the labs shown in the TIM film series and see how effective they were in achieving the results. After all, monocane (and duocane) had to be developed and tested in a laboratory and this is what we will examine. Are the labs shown in the TIM series realistic and functional? Let us take a closer look.

From the start we will acknowledge that no such substance like monocane really exists that can render anything invisible. As described by Dr. Crawley, the employer of Dr. Jack Griffith, the original invisible man, monocane is, "a drug made from a flower grown in India. It draws color from everything it touches." For something to be invisible light must pass through it and not simply just "draw color". (In reality it would be all about changing the physical optical density of matter.) Crawley further goes on to state that monocane "turned a dog dead white, like a marble statue." There is no known substance that can do that either. However, assuming monocane does exist then a laboratory setting is necessary to study it and much fun and understanding can be obtained by a careful examination of what was shown in each film of the TIM series.

The original Universal Studio "invisible run" consisted of five TIM films starting with the seminal, THE INVISIBLE MAN (1933), followed by THE INVISIBLE MAN RETURNS (1940), then THE INVISIBLE WOMAN (1940), INVISIBLE AGENT (1942), and finally THE INVISIBLE MAN'S REVENGE (1944). Of these 5 films only AGENT does not have a lab scene so this will not be included in this discussion. It is interesting that the four remaining TIM films have a wide range of lab sets that may be more useful and functional than first thought so they deserve a closer examination. Also, some lab sets may be less functional than necessary and we will look at those too.

The Art Director for TIM was Charles D. Hall and the Property Master was Wally Kirkpatrick. For both RETURNS and WOMAN the Art Director was Jack Otterson and the Set Decorator was Russell A. Gausman. For REVENGE the Art Directors were John B. Goodman and Harold H. MacArthur and the Set Decorators were Russell A. Gausman and Andrew J. Gilmore. So, for

RETURNS, WOMAN, and REVENGE the set decorator, Russell Gausman, was the same so this has some sort of continuity. Even so, there are still significant and interesting differences in the lab setups.

From the first film in 1933 to the last of the series in 1944 represents an 11-year span and much has changed in lab science during those years. Though much of the glassware and bench bling are the same (a beaker is a beaker) the way they were set up, interconnected, and the overall flow from one lab station to another show a better understanding of how real labs function as the series progressed or, perhaps as seen in the later films of the series, did not function. Also, the respective film budgets must also be taken into consideration. As the film series progressed the budgets were shrunk as well as the various lab set-ups.

It would be easy to essentially set up the same lab scenery in each film since the paying public would not appreciate or care about any difference as long as it looked scientific. However, each lab is different suggesting that there was at least some thought given to functionality and aesthetics of the lab setup. This is especially interesting since (presumably) the same set decorator, Gausman, made the lab sets quite different. It is also clear that as the series progressed into the 4th and 5th films of the series the budgets were reduced and this shows in the labs themselves with the later films being much weaker in presentation. (However, pragmatically, most likely no one cared or probably noticed. Labs are just there to give the impression of some sort of science is going on to help advance the plot and action.)

THE INVISIBLE MAN (1933)

In the original 1933 TIM film we see two labs. The first is more sophisticated and is where monocyte was originally obtained and tested by Dr. Jack Griffith. This is the lab of Dr. Crawley (and appears to be in his home). Though a relatively sparsely cluttered lab it is well stocked for the work of a chemist, which Crawley is, consisting mostly of various pieces of glassware many of which contain (unnecessarily) large volumes of dark liquids plus many jars of chemicals. Many of the liquid-containing pieces of glassware have open tops suggesting that air contamination is not a concern. A centrifuge is shown working, there are numerous test tubes, various flasks, graduated cylinders, a pan balance, monkey bar rigs holding glassware interconnected with rubber tubing, and the ever present lit Bunsen burner (also clearly visible is an *un-lit* Bunsen burner, almost a rarity in SF films) all indications of an active chemist's lab. (To me, this lab seemed almost too clean to be such an active lab.) Of note is the presence of numerous items of glassware that have cotton wads pushed into their openings instead of the usual rubber stoppers. Cotton wads are indicative of glassware containing sterile liquids and are out of place for the type of work Crawley was doing. Also, present is a large desk cluttered with books and notes and large well-stocked book shelves with various tomes and journals. On one wall are clipboards with various notes and papers.

The second “lab”, that of Dr. Jack Griffith, much less sophisticated and essentially useless for what was needed to make an antidote to monocane, is based on a table top in an upstairs room for rent at the Lion’s Head pub. Yes, I understand that this is all set dressing but nevertheless, we can have some fun and actually learn a few things by taking a little closer look at what these labs actually accomplished. What is also important to learn here is that you can literally have a functional lab anywhere. A flat surface to place some items, like a “Jack Griffith table top”, is all you really need so anything can serve this purpose.

Once holed up in his room-for-rent, Dr. Griffith was attempting to make an antidote to the invisible effects of monocane. An antidote is something that will either neutralize a compound or inactivate it thereby preventing further problems; essentially something that will take away or reduce bad effects. Most antidotes are used for poisons and toxins suggesting that monocane had some sort of toxin-like effects. This is somewhat confirmed when Griffith goes insane as the film progresses (though in reality toxins do not affect the psyche as seen in the film). Also, note that an antidote is designed to counteract an acute problem, not a chronic problem. Should monocane work by a different mechanism (most likely) then an antidote is the wrong approach to take. What Dr. Griffith should be trying to create is a compound that can reverse the invisibility (“there must be a way back!”), not to mention reversing the mental decay accompanying this disorder, and not be trying to neutralize or inactivate something. For monocane to properly work then there would be some sort of permanent change (in EVERY cell of the body) and not a temporary change that would be neutralized by an antidote to monocane. Therefore, an ingested antidote would not work as well as an injected antidote.

What Griffith has cluttered on the top of his table in his room-for-rent “lab” is quite useless for what he needs to make. On this tabletop are a pan balance, a nice binocular microscope (quite a contemporary and expensive item for 1933; and quite unnecessary for the work at hand), and several glass containers with cotton wads as plugs suggesting more sterile work. Several of the glass containers are a dark color (typically brown) and are usually necessary to protect light-sensitive chemicals. Also quite visible on the table is a bottle of Milk of Magnesia, an ingredient for an antidote, perhaps?

For monocane itself, Griffith describes how he used it thusly, “a little bit of this injected under the arm every day for a month”. (Was it a gradual progression to invisibility during the 30 days of treatment or was he OK until the 30th day when, on the last injection, he immediately became invisible?) While saying this he is holding a large open glass container about half filled with around 500ml (for comparison, a large plastic soda bottle contains around 750ml) of a dark liquid, presumably monocane. I am not sure what a “little bit” actually is and an injection under the arm (arm pit?) is unusual; the actual injection site would be irrelevant but most likely be at the bend of the arm because of easy access.

Lastly, we see Griffith's body become materialized as he dies. An attending physician remarks, "The effects of the drugs (monocane) will die with him. His body will become visible as life goes." This suggests that monocane is dependent upon biological effects for its invisibility properties to work and when biology stops from death then monocane would no longer work. As such, this biological mode of action will not be altered with any sort of antidote.

THE INVISIBLE MAN RETURNS (1940)

The lab shown in RETURNS is that of Dr. Frank Griffith and is well equipped, laid out well, and appears to be in a clinic. Present in the lab are shelves stocked with books, chemicals, and glassware, a nice pan balance (that inexplicably gets moved from one bench to another later in the film. These delicate balances are quite sensitive and should not be moved at all since this will require detailed and time consuming recalibration), a nice binocular microscope, a simple blood extraction centrifuge, the ever present lit Bunsen burner (with a dark boiling liquid in a flask above it; what is he really boiling?), wall clipboards, and, as a very nice touch, an autoclave (this was just a set piece, had no bearing on the film, and no one would have noticed if it were not there. It does give a lot of verisimilitude to the overall look of the lab scene). On one wall are cranial and spinal x-ray images. All in all some high tech stuff for 1940. The set budget for RETURNS must have been generous.

Of note is the presence of large amounts of dark liquids in many of the pieces of glassware. The amounts of liquids are excessive and do not serve any real purpose other than trying to show a busy lab with a lot of seemingly interesting stuff going on. Several of the pieces of glassware are interconnected with rubber tubing; these setups are used primarily for distillations and separations of liquids.

A side room to the main lab is a vivarium, a place to keep small animals for scientific studies. This vivarium also is well laid out and well equipped for the work at hand. Both rabbits and guinea pigs are seen with the guinea pig as being the main, well, guinea pig in the invisibility reversing procedure. Dr. Griffith uses a typical glass syringe for injecting the guinea pig but the procedure is totally lacking in any sterile technique. The vivarium bench has test tubes and other glassware and the back wall shelving has many notebooks that would be quite normal for an active vivarium in which many of the animals have their own separate notebooks for the recording and keeping data.

In a phlebotomy (blood drawing) session Dr. Griffith removes blood from the arm of the invisible man (Vincent Price). Griffith properly palpates for the vein (you do not need to actually "see" the vein to locate it in order to inject a syringe needle), correctly swabs the area with alcohol thereby sterilizing it, and then inserts the needle. Those experienced with this blood drawing procedure can feel a slight puncture as the needle enters the vein so, again, you do not actually need to "see" everything since the other senses of touch and feel are adequate for blood

drawing. This entire blood drawing procedure in the lab with the invisible man is quite plausible.

Lastly, in a back room in the home of Dr. Griffith and on a small table is present some functionless lab glassware that serves no obvious purpose (the set dresser probably thought it would help make the scene look more scientific). And on another small table in the same room are many test tubes. Griffith apparently does some clandestine chemistry in his home.

An interesting observation is the essentially seven-year gap between the first film, TIM, and the first sequel, RETURNS. The lab set of RETURNS is far more sophisticated than the original TIM and the seven-year gap is telling. Also, in RETURNS the word, monocane, is not used. Instead, the word "duocane" is (inexplicitly) used and defined as, "an extract of an east Indian herb that took the color out of things...combined with other ingredients...made the body transparent when injected in the blood stream." All of the work of Dr. Frank Griffith is focused on developing an antidote to the effects of invisibility, particularly the psychotic madness that develops, and the lab set up comes pretty close to looking convincing.

THE INVISIBLE WOMAN (1940)

In this film we see two labs of sorts and neither one is really adequate. The first lab is that of Professor Gibbs. Readily seen are a nice binocular microscope (most likely the same one seen in RETURNS), many pieces of glassware (retorts, flasks, beakers, test tubes, graduated cylinders) that are (unnecessarily) full of dark liquids, bookshelves well stocked with books and bound journals, a pan balance, and perhaps most surprising, no Bunsen burner anywhere in sight. There is a glassware setup that is interconnected with rubber tubing suggesting some sort of distillation procedure (note: distillation setups require heat to boil and evaporate a liquid that condenses after being cooled and without a Bunsen burner to do this the setup is nonfunctional and just takes up valuable bench space). On one back area are two large gas cylinders but, against safety codes, are not chained to a wall (if one of the cylinders should fall and the top comes off then those highly pressurized tanks go off like a rocket and can cause much mayhem). Also present are various electrical devices that lend an air of high-tech science. All the glassware suggests Gibbs is making various small chemical compounds.

The invisibility machine and its control box are just cool looking machines with lots of lights that look important but serve no real purpose. (Since nothing like it can physically work in the real world then literally anything can be assembled just as long as it looked convincing and for 1940 this machine was adequate.)

As Prof Gibbs injects his invisibility liquid into the arm of Kitty Carroll, the Invisible Woman, the injection itself is well done with the appropriate swabbing with a cotton ball.

The second lab, if that is the right word, is that of the “bad guy”, and mostly consists of one large wood bench that is covered with many sorts of glass containers, many with either chemicals or liquids. Its only purpose is to show the audience that something scientifically important must be going on here though, in reality, nothing really is.

Since both RETURNS and WOMAN were made in 1940 the lab seen in WOMAN followed quickly after RETURNS so there was essentially no time lag. Also, RETURNS and WOMAN had the same art director and the same set decorator. However so, the labs seen are significantly different suggesting there were not only plot differences requiring different lab set-ups but also budget limitations on WOMAN since this is the inferior (and sparser) of the two.

THE INVISIBLE MAN'S REVENGE (1944)

The last film of the original Universal invisibility series is REVENGE and the lab seen is that of Dr. Drury (John Carradine). It's noted that Drury's lab is directly connected to his living quarters (call the hazardous materials team!). The main set piece for his lab is a long wood bench that is cluttered with all sorts of fluid-containing glassware, test tubes and racks, chemicals, and even a human skull (mostly just because since it serves no purpose). Also present are several ring stands holding various flasks, a pan balance (high up on a shelf making it awkward and impractical to use frequently), bell jars, mortar & pestle, and, somewhat surprisingly, no microscope in sight. Overall, the lab bench looks busy compared to the almost too clean lab benches seen in TIM and especially RETURNS.

Behind curtains were several cages housing various animals, in particular dogs, one even being “invisible”. At a nearby desk is a shelf well stocked with books and journal volumes. Also, on a wall is an x-ray of a human skull.

Instead of the almost proverbial lit Bunsen burner (note: there is one on a small side table, under a flask ring stand connected to a distillation tube, but that burner is, remarkably, unlit so it doesn't really count) we see a small lit alcohol burner under a small glass retort flask held up on a ring stand; its purpose is unknown. Alcohol burners give low heat. My guess is it may have been used in a distillation process to make the invisibility serum.

For the blood transfusion scenes (all reasonably accurate for 1944) we see a nearby test tube rack and the tubes have cotton plugs indicating sterile liquids. Unfortunately, Drury uses a very non-sterile technique when loading his syringe with the invisible-causing serum before injecting it into his “volunteer” (John Hall). It appears Drury injects about 10cc of fluid into Hall and within a few minutes it causes him to become invisible. Later, during the blood transfusion scenes (both with dogs and then later with humans), around 10cc is transferred with each pull of the syringe. On film we see just a couple of pulls of the syringe. For the

humans it is unclear how much blood was actually transferred but either little blood was needed or maybe a liter or more of blood was transfused, it is hard to tell (around 50 pulls of that syringe would be needed to transfer just one unit of blood. Humans contain around 8 liters of blood in their bodies and a unit of blood is around half a liter). Earlier in the film Drury hinted that an entire body's worth (i.e., all 8 liters!) of blood would be needed to reverse the invisibility effects on a human.

Summary

The laboratory scenes are more important in terms of plot drivers for TIM and RETURNS than they were for the later films in the series and it shows. More care in both layout and amount of material shown in the lab scenes for TIM (the first lab, of course) and RETURNS are seen since these sets were important for the film's plot and action. For WOMAN and REVENGE the labs were essentially secondary plot drivers and were more visually suggestive of "lab life" than any sort of nod to functionality as seen in the earlier films. And to be sure, at the time of their release, no one noticed any difference.

So, if we had to rate the labs in terms of at least appearing to be useful in achieving the necessary results as shown in the films the best lab was seen in RETURNS followed by the first lab seen in TIM. Then, a distant third is REVENGE. Then comes the weak labs seen in WOMAN and hands down the worst lab and totally useless for what was necessary is that of the original Invisible Man (Claude Rains) on his tabletop in his room-for-rent.

Thanks for reading. It's back to the lab for me. Stay healthy and eat right.